

[54] HAIR DYEING INSTRUMENT

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[52] U.S. Cl. .... 132/88.5

[58] Field of Search ..... 132/11 R, 9, 112, 88.5;  
D28/7, 10; 222/206, 214, 215, 220

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[57] ABSTRACT

A hair dyeing device provides the manual hair dyeing functions which permit a hair dyeing for each bundle of hairs to be completed in single operation, and comprises two separable outer housing segments to be engaged for use and two inner housing parts each to be accommodated for forward and backward sliding movement in the corresponding outer housing segments. The outer housing segments as combined form slits at the opposite ends and a longitudinal intermediate slit between the opposite slits, the opposite slits allowing a bundle of hairs to be guided therethrough. The inner housing parts each include a bellows to control the volume thereof, and a hair dye feeder which includes a hair dye container and a hair dyeing teeth array.

19 Claims, 11 Drawing Figures

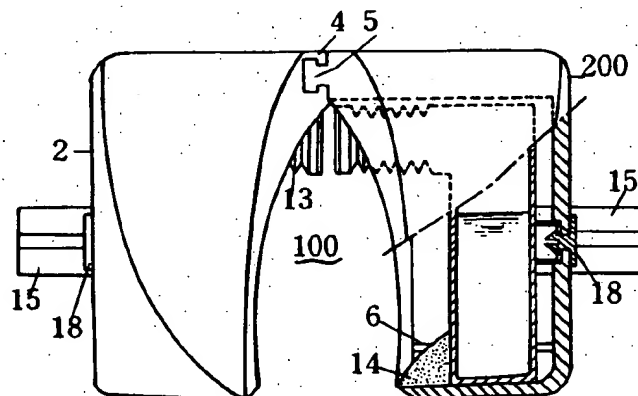


FIG. 1

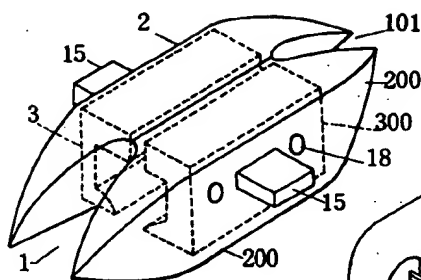


FIG. 4

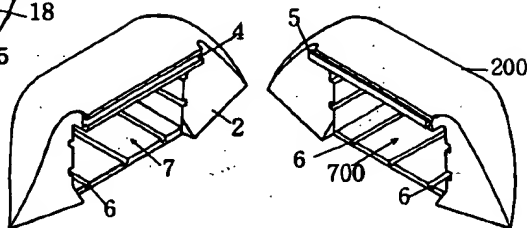


FIG. 2

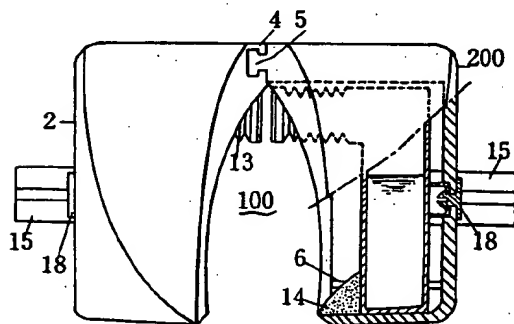


FIG. 5

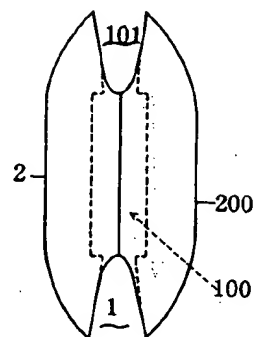


FIG. 3

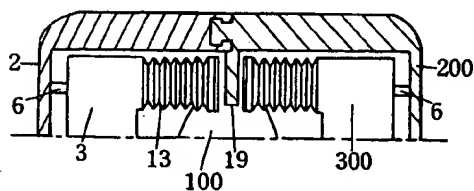


FIG. 6

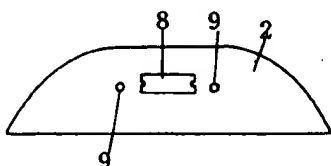


FIG. 7

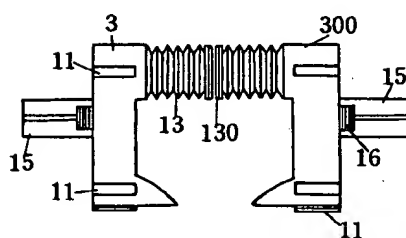


FIG. 8

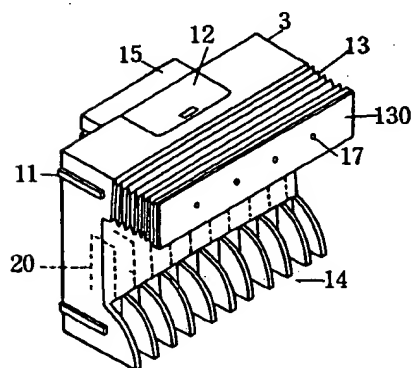


FIG. 9

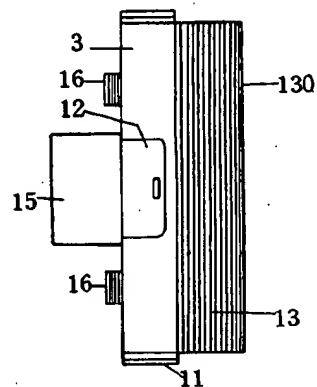


FIG. 10

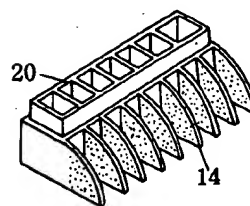
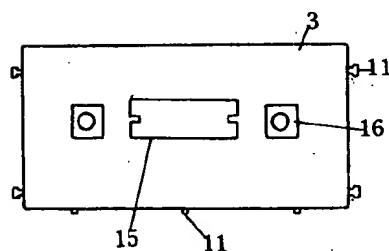


FIG. 11



## HAIR DYEING INSTRUMENT

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates generally to a hair dyeing instrument for dyeing human head hairs, and more particularly to a hair dyeing device which permits hair dyeing for each bundle of hairs to be completed in a single operation so that the hairs can be dyed down to their roots without affecting the scalp which is sensitive to certain ingredients in the hair dye.

#### 2. Description of the Prior Art

Hair dyeing is usually done by hand, and the hair dyeing device that is known in this field is usually a comb specifically designed for the hair dyeing work, which simply contains a hair dye therein to be applied when it is used. However, the prior art device is not constructed to provide a constant flow of the dye. This causes more or less of the dye to adhere to the human scalp during the operation of the device. As the dye usually contains some harmful ingredients to which the scalp is sensitive, the use of such a device is not always recommended. Furthermore, the design of the prior art device is not such as to permit each hair dyeing to be completed in a single operation.

### SUMMARY OF THE INVENTION

In view of the problems of the prior art device, one object of the present invention is to provide a novel and improved hair dyeing device which permits a single operation to complete the dyeing for each bundle of hairs, so that the hairs can be dyed down to their roots without affecting the scalp.

Another object of the present invention is to provide an improved hair dyeing device which includes means to protect the scalp against the sticking action of the hair dye that usually contains harmful ingredients to which the scalp is sensitive.

Still another object of the present invention is to provide a hair dyeing device which permits single dyeing operations to be performed in a successive manner.

### BRIEF DESCRIPTION OF THE DRAWINGS

Those and other objects and features of the present invention will more clearly be seen by the following description to be made by referring to the accompanying drawings, in which:

FIG. 1 is a perspective view of the hair dyeing instrument in a typical preferred embodiment of the present invention;

FIG. 2 is a front view, partly broken away, of the same;

FIG. 3 illustrates the essential elements in a varied form including a down-hanging partition which permits the two inner housing parts to be operated independently of each other;

FIG. 4 is a perspective view of the two outer housing segments shown as disconnected, each having a chamber to accommodate the inner housing part;

FIG. 5 is a top view of the outer housing segments shown as coupled;

FIG. 6 is a rear view of one of the outer housing segments;

FIG. 7 is a side elevation of the two inner housing parts each including a hair dye container and an array of hair dyeing teeth;

FIG. 8 is a perspective view of one of the inner housing parts in FIG. 7;

FIG. 9 is a top view of FIG. 8;

FIG. 10 is a perspective view of a variation of FIG. 8, showing the hair dye container and hair dyeing teeth array portion provided as a separate element; and

FIG. 11 is a rear view of one of the inner housing parts.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

One preferred embodiment of the present invention is now described in greater detail by referring to the drawings. As particularly shown in FIG. 1, the hair dyeing device comprises an outer housing having two detachable segments 2 and 200 which are to engage each other for use and provide chambers for accommodating corresponding inner housing parts 3 and 300 later to be described. The outer housing segments 2 and 200 have a similar structure, and are coupled together to provide slits 1 and 101 at the opposite ends and a longitudinal intermediate slit 100 between the slits 1 and 101 as best shown in FIG. 2. Those slits serve as a guide through which a certain width or bundle of hairs can be gathered and guided. As more particularly viewed from FIGS. 4 and 5, each of the outer housing segments which are shown as detached and as coupled, respectively, has a generally horn-like shape having a cutout or slit at the opposite ends and an intermediate cutout or slit extending longitudinally from one to the opposite end. When the two outer housing segments 2 and 200 are combined together, the cutouts for both provide the slits 1 and 101 which allow a bundle of hairs to be guided therethrough and the longitudinal cutouts together provide an intermediate hair passage 100 connecting between the opposite slits 1 and 101. The slits 1 and 101 as combined provide a progressively narrower recess or tapered shape in plane as viewed in FIG. 5, which allows hairs to be gathered at the innermost point of the slits which is the narrowest. As described above, the outer housing includes the two detachable segments 2 and 200 to be coupled together. As particularly shown in FIG. 3 and FIG. 4, one of the two segments, which is designated by 2 for example, has a guide groove 4 extending along the upper longitudinal edge of the segment 2. The other segment, designated by 200, has a T shape rail 5 in section extending along the upper longitudinal edge thereof opposite the guide groove 4. The two segments 2 and 200 can be coupled together by engaging each other such that the T shape rail 5 is slid into the guide groove 4 from either of the opposite ends thereof. Each of the two segments 2 and 200 provides a chamber 7, 700 inside for accommodating the corresponding inner housing part 3, 300, which contains a hair dye receptacle and a dyeing teeth array which are later to be described. As viewed in FIGS. 3 and 4, each of the segments 2 and 200 has a plurality of guide grooves 6 extending transversely of the segment, which allow the corresponding inner part 3, 300 to be guided for forward and backward sliding movement. In FIG. 6 which shows one of the segments, designated by 2, the segment has at the back thereof an elongated aperture 8 through which a push button 15 on the corresponding inner housing part 3 normally protrudes, and a plurality of apertures 9 which are used for securing the inner part to the outer segment. This applies to the other segment 200 not shown. The bottom of each of the outer housing segments 2 and 200 is slightly slanted or curved up-

wardly at the opposite ends as viewed from FIG. 1. This curved shape is primarily intended to reduce the effective contact area of the bottom portion with the human scalp surface.

Referring particularly to FIGS. 7 and 8, the construction of the inner housing parts 3 and 300 designed to contain a hair dye receptacle and a hair dyeing teeth array is illustrated. For the convenience of simplicity, the following description will be limited to one of the inner housing parts, designated by 3, but as a matter of course also applies to the other inner part which is designated by 300. The one part of the inner housing, shown by 3, is formed like a generally reversed L shape in section, and has a plurality of rails 11 traversing the opposite sides and the bottom thereof, which correspond to the respective grooves 6 provided on the bottom surface of the chamber 7 in the outer housing segment 2 and can be guided therein for forward and backward sliding movement. The inner housing part 3 has at the top thereof an inlet with a lid generally designated by 12, through which a hair dye is supplied into the hair dye receptacle which is formed inside the inner housing parts.

As particularly seen from FIG. 8, the inner housing part 3 has an integral expandable or retractable bellows 13 extending from one side of the inner housing part in the horizontal plane aligned with the top surface thereof. At the lower portion of the inner housing part 3, there is provided an array of comb teeth 14 arranged in the longitudinal direction of the inner housing part, from which a constant flow of hair dye provided by the hair dye receptacle is fed. Furthermore, the inner housing part 3 includes the aforementioned push button 15 and resilient members 16 on the opposite sides of the button 15. The expandable or retractable bellows 13 makes the volume of the inner housing part 3 variable, as described below. The bellows 13 has at the free end side a rubber sheet 130 having a plurality of air inlet holes 17. The air inlet holes have the following function. When the push buttons 15 on both inner housing parts 3 and 300 are pushed inwardly by fingers of one hand simultaneously, the corresponding bellows 13 are then allowed to be moved forward to be closer to each other. When the opposite rubber sheets 130 of both bellows 13 are finally brought in contact with each other and the bellows are further pushed inwardly causing a further contraction, the air inlet holes 17 on both bellows are blocked to impede the air passage. This action causes a reduction in the volume of the inner housing parts, resulting in a rise in the internal air pressure. With the rising internal pressure, a flow of the hair dye in the receptacle is forced out toward the comb teeth array. After the above operation is completed, the push buttons are released from the fingers, allowing the inner housing parts 3 and 300 to be moved back to their original positions under the action of the resilient members 16 which is later to be described. This also moves the bellows 13 facing each other to be moved away from each other, thus allowing air to be introduced again through the air inlet holes 17. This expands the bellows 13 again. The position of the air inlet holes on one bellows should preferably be slightly different with regard to that of the air inlet holes on the opposite bellows, in order to ensure the impedance of the air flow through the air holes when the opposite rubber sheets 130 carrying the air holes meet each other.

The array of comb teeth 14 extending longitudinally along the lower portion of the inner housing 3, for

example, includes individual teeth extending perpendicularly to the longitudinal axis of the teeth array. The individual teeth communicate with the partitioned receptacle which contains a hair dye inside the inner housing. Each of the individual teeth has a length that allows the whole part to be accommodated snugly inside the chamber 7 of the outer housing 2. As described earlier, this applies similarly to the other one of the pair, such as in the case of the chamber 700 in the other housing 200. The individual teeth on both arrays are arranged such that the teeth on one array mesh with those on the opposite array when the two inner housing parts 3 and 300 are brought the closest to each other. Those teeth are impregnated with a hair dye which is supplied from the receptacle when there is a rising internal pressure caused by compressing the bellows 13, as described earlier. In order to make this impregnation easier, the various forms of the individual teeth portions may be provided, such as by making a bundle of synthetic resin fibers, by using porous material, by using a cloth wrapper, and by using any other impregnable material.

In the embodiment shown in FIG. 8, the portion including the hair dye receptacle and teeth array is formed as an integral part of the inner housing 3, 300. In its varied form shown in FIG. 10, that portion may be provided as a separate element. In this variation, it is possible to provide spare elements of choice depending upon their usage. That is, those separate elements can provide replacement parts which meet any particular needs, such as hair dyes of varying concentration and teeth materials of different impregnation properties.

As described earlier, each of the inner housing parts 3 and 300 has the push button 15 and the resilient members 16 at the back side thereof. As viewed from FIGS. 2, 6, 7 and 9, the resilient members 16 are secured to the corresponding apertures 9 in the outer housing 2, 200 by means of any suitable fixture 18. The resilient members are normally placed in their contracted state. While a force is then being supplied by pushing both buttons 15 inwardly to expand the resilient members, the members are always trying to contract themselves against the applied force. Then, releasing the buttons allows the resilient members to return to their original state by themselves, thus moving the inner housing parts 3 and 300 under the contracting action of the members back to their respective original positions inside the chambers 7 and 700. The push buttons 15 have their exposed sides protruding through the elongated apertures 8 in the rear side of the outer housing segments 2 and 200. As particularly seen from FIG. 11, each of the push buttons has grooves which run in the longitudinal direction on the opposite sides of the button. These grooves engage the corresponding projections which extend inwardly from the opposite side edges of the elongated aperture 8. This permits a smooth sliding movement of the push buttons when they are pushed or released. The length of the push button which is wholly exposed out of the aperture 8 may be determined by the parameters such as the earlier mentioned clearance or gap 100 formed to allow a bundle of hairs and the teeth array 14 to pass there-through.

In the basic embodiment and variation thereof which have been described, the outer housing 2 and 200 and inner housing 3 and 300 should preferably be made of transparent material which permit a visual check of the amount of the hair dye contained in the receptacle.

Alternatively, a transparent window may be provided for this purpose.

The bottom of the inner housing parts 3 and 300 should preferably be slanted similarly to the corresponding slanted bottom portion of the outer housing segments 2 and 200. This effectively permits the individual teeth in the array 14 to be brought into contact with the roots of the hairs without affecting the scalp surface. The hair dye receptacle in either its integral or separate form is partitioned as shown by 20 corresponding to the individual teeth. This partitioned construction can effectively supply an equal quantity of the hair dye to the individual teeth when the hair dyeing device is tilted for use. Thus, the individual teeth can provide uniform feeding of the dye.

In a varied form shown in FIG. 3, a downwardly extending partition 19 is provided on one of the outer housing segments, as shown by 200, which is located in the central position at which the opposite bellows meet each other. This permits the operation of the inner housing parts 3 and 300 to be done independently of each other.

The operation of the hair dyeing device, whose construction has fully been illustrated in the foregoing description, is now described. A certain width or quantity of hairs that is desired to be hair-dyed at a time is first inserted into the gap or slit 1 formed between the outer housing segments 2 and 200. Then, the device is operated to travel forward along the human head. During this movement, the hairs caught in the slits 1 and 100 are bent according to the curved profile of the slits, but the roots of the hairs remain upright by nature. Then, the push buttons 15 are pushed by fingers of one hand in the direction to cause the inner housing parts 3 and 300 to travel inwardly. This action contracts the bellows 13, 13 to reduce the internal volumes of the inner housing parts, causing a rise in the internal air pressure. The rising internal air pressure causes the hair dye in the partitioned receptacle to flow toward the individual teeth, which are then impregnated with the hair dye. The hair dye contained in the individual teeth is then oozed out during the travel of the device or teeth along the head, adhering to the roots of the hairs without affecting the scalp itself. After the initial hair dyeing operation is completed, the push buttons are released. As the hair dyeing device advances to any succeeding bundles of hairs, these pushing and releasing operations are repeated, resulting in uniform application of the hair dye to the roots of the hairs for each operation. In this case, as described earlier, releasing the push buttons causes the resilient members 16 to be freed from the pushing force and expand themselves, urging the inner housing parts 3 and 300 to be moved away from each other so that the clearance or gap 100 can be reopened and the air inlet holes 17 can be exposed to admit air into the inner housing parts. The above steps will be repeated until all desired hair dyeing operations have been completed.

As the present invention has been described in detail with reference to the various embodied forms thereof, it provides advantages over the prior art similar devices. The hair dyeing device according to the invention permit a constant hair dye to be supplied for each dyeing process, which can be completely achieved in a single operation. The device can easily be handled by the user, whose hands can be kept clean from the hair dye compounds, and is also easy to be cleaned after use.

Although the present invention has been described by reference to the embodiments by way of example, it should be understood that various changes and modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. A hair dyeing device comprising:

an outer housing, including first and second detachably joined segments, having opposite front and rear ends, a bottom surface and first and second side surfaces extending upward from said bottom surface on said first and second segments, respectively, and having a longitudinally extending passage formed between said first and second segments, open along said bottom surface, to define a longitudinally extending gap therein and opening at said front and rear ends for allowing a bundle of hair to be guided therethrough from said front end to said rear end;

said first and second segments respectively having opposing first and second chambers formed therein opening into said passage;

an inner housing, including opposing first and second parts respectively in said first and second chambers, slidable toward and away from each other in said first and second chambers, said first and second parts being contractable in response to sliding movement thereof;

first and second hair dye feeding means, respectively coupled to said first and second parts for sliding movement therewith, for feeding hair dye to the bundle of hair in said passage in response to the contraction of said first and second parts;

said first and second hair dye feeding means respectively including first and second hair dye receptacles for storing the hair dye and first and second arrays of hair dyeing teeth in respective fluid communication with said first and second receptacles, engagable with the bundle of hair for delivering the dye to the bundle of hair; and means for sliding said first and second parts toward and away from each other.

2. A hair dyeing device as in claim 1, wherein said first and second parts respectively include first and second bellows respectively enclosing first and second internal gas filled spaces in respective fluid communication with said first and second receptacles, and means for contracting said first and second bellows whereby gas from said first and second bellows forces the dye in said first and second receptacles to said first and second arrays of teeth.

3. A hair dyeing device as in claim 2, wherein said first and second bellows have air inlet apertures for receiving air from the external atmosphere into said first and second internal spaces, said device further comprising means for covering said inlet apertures to block the passage of air therethrough when said first and second parts are slid toward each other.

4. A hair dyeing device as in claim 3, wherein said first and second bellows respectively comprise first and second parallel opposing surfaces, said covering means comprising said first and second parallel opposing surfaces, said air inlet apertures being formed in said first and second opposing surfaces, said first and second opposing surfaces being brought into flush abutment with each other to block air passage through said apertures when said first and second parts are slid toward each other.

5. A hair dyeing device as in claim 3, wherein said covering means comprises means, mounted to said outer housing and extending midway between said first and second bellows, for intercepting said first and second bellows so as to block said apertures when said first and second parts are slid toward each other.

6. A hair dyeing device as in claim 1, wherein said first and second parts comprise first and second means, respectively responsive to contraction thereof, for applying pressurized air into said first and second receptacles so as to force the dye therein to said first and second arrays of teeth.

7. A hair dyeing device as in claim 1, wherein said bottom surface curves upward at said front and rear ends.

8. A hair dyeing device as in claim 1, wherein said outer housing has a top surface opposite said bottom surface, formed on said first and second segments; said passage opening into said top surface at said front and rear ends; said first and second segments being detachably joined at said top surface between said front and rear ends.

9. A hair dyeing device as in claim 1, wherein said first and second parts are slidable in horizontal directions transverse to said longitudinally extending passage.

10. A hair dyeing device as in claim 1, or claim 2 or claim 9, wherein said sliding means includes means for resiliently urging said first and second parts apart.

11. A hair dyeing device as in claim 1, wherein said longitudinally extending passage widens at said first and second ends so that said longitudinally extending gap in said bottom surface widens at said first and second ends.

12. A hair dyeing device as in claim 9 or claim 11, wherein said sliding means further comprise first and second push buttons respectively mounted to said first and second parts, respectively protruding transversely and horizontally through said first and second side surfaces, said first and second push buttons being responsive to horizontal and transverse pressure applied thereto, for sliding said first and second parts toward each other.

13. A hair dyeing device as in claim 9, wherein said first and second arrays of hair dyeing teeth of said first and second hair dye feeding means is arranged longitudinally in transversely opposing relation so as to mesh with the teeth of the opposing array when said first and second parts are slid toward each other.

14. A hair dyeing device as in claim 12, wherein said teeth comprise a material which is impregnable by liquid hair dye.

15. A hair dyeing device as in claim 12, wherein said teeth comprise a porous material.

16. A hair dyeing device as in claim 1, wherein said first and second hair dye receptacles each comprise a plurality of partitioned spaces, each of said partitioned spaces being in fluid communication with a separate hair dyeing tooth of one of said first and second arrays of hair dyeing teeth.

17. A hair dyeing device as in claim 1, wherein said first and second hair dyeing means are respectively integrally formed with said first and second parts.

18. A hair dyeing device as in claim 1, wherein said first and second hair dyeing means respectively comprise a first integrally formed element and a second integrally formed element, respectively removably mounted to said first and second parts.

19. A hair dyeing device comprising:

an outer housing, including first and second joined segments, having opposite front and rear ends, having a bottom surface and having a longitudinally extending passage formed between said first and second segments, open along said bottom surface to define a longitudinally extending gap therein, and opening at said front and rear ends for allowing a bundle of hair to be guided therethrough from said front end to said rear end;

said first and second segments respectively having opposing first and second chambers formed therein opening into said passage;

an inner housing, including opposing first and second inner housing parts respectively slidably mounted in said first and second chambers, so as to be respectively slidable in said first and second chambers toward and away from each other in horizontal directions extending transversely of said longitudinally extending passage, said first and second inner housing parts being contractable in response to sliding movement thereof;

first and second hair dye feeding means, respectively coupled to said first and second parts for sliding movement therewith, for feeding hair dye to the bundle of hair in said passage in response to the contraction of said first and second parts, said first and second dye feeding means respectively including first and second hair dye receptacles for storing the hair dye and first and second arrays of hair dyeing teeth in respective fluid communication with said first and second receptacles, engagable with the bundle of hair for delivering the dye to the bundle of hair, and means for sliding said inner housing parts toward and away from each other.

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July 31, 1928.

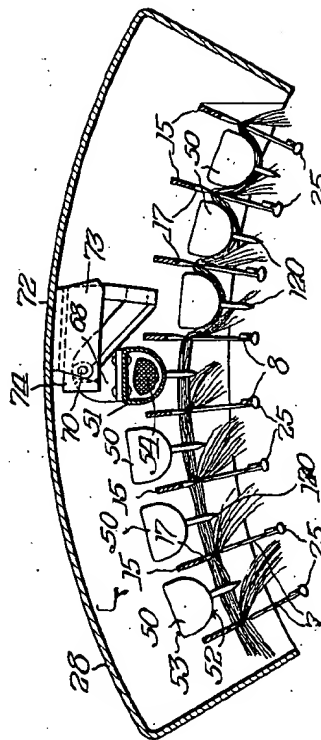
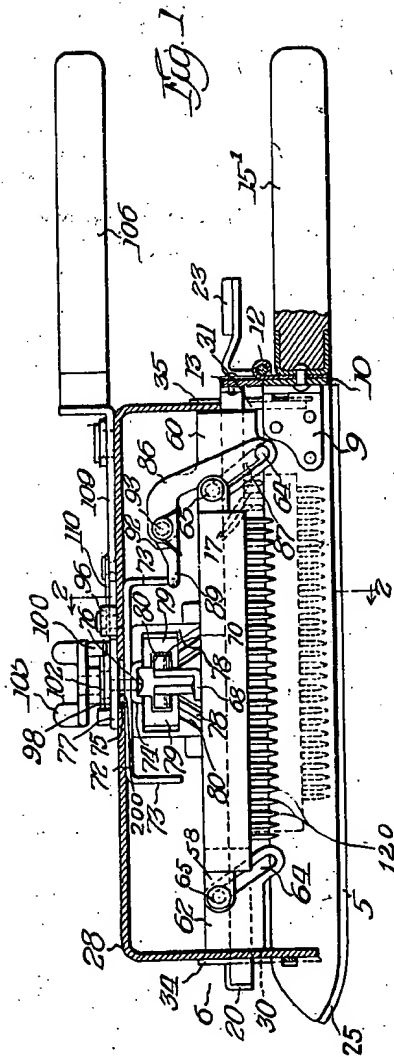
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HAIR WAYER

Filed May 10, 1924,

3 Sheets-Sheet 1



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July 31, 1928.

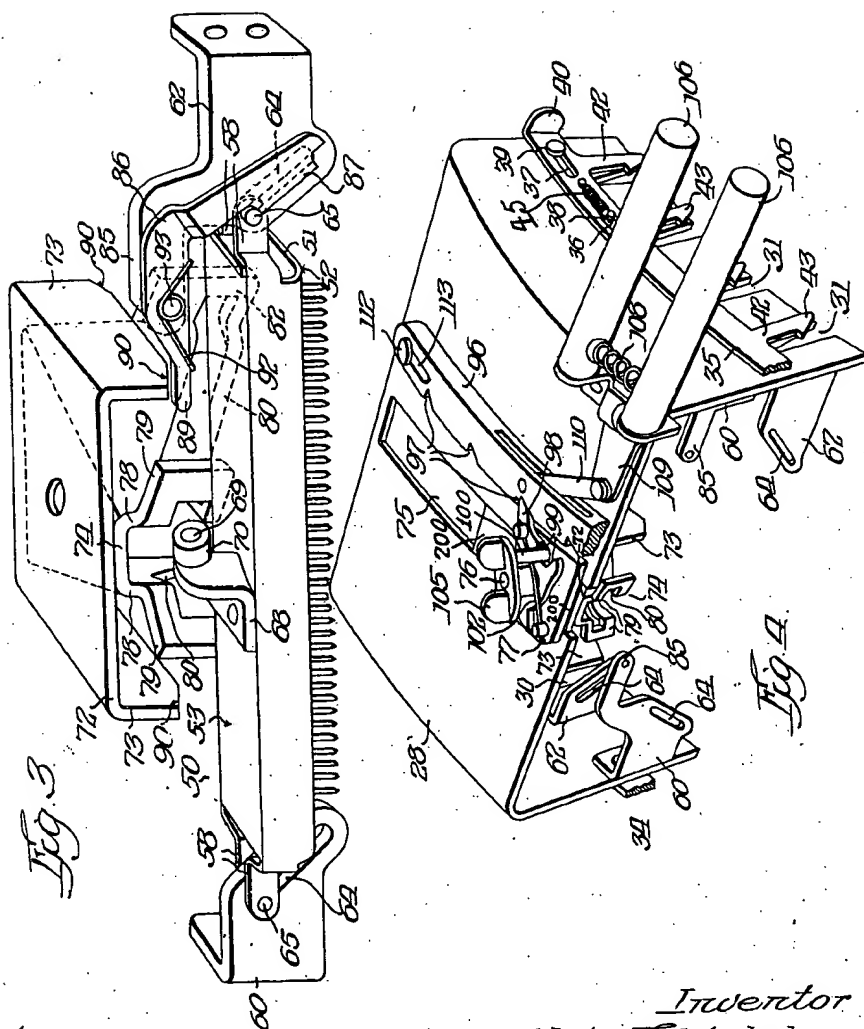
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Filed May 10, 1924

3 Sheets-Sheet 2



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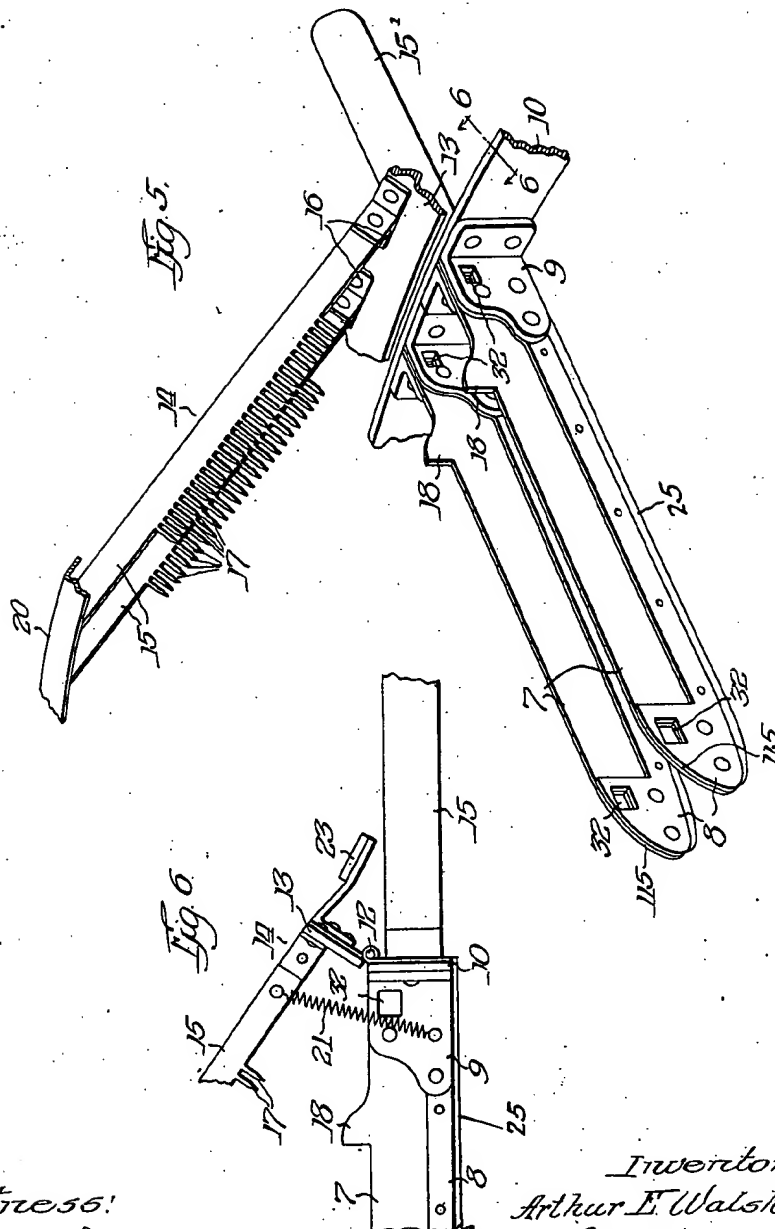
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Filed May 10, 1924

3 Sheets-Sheet 3



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Patented July 31, 1928.

1,678,891

# UNITED STATES PATENT OFFICE.

ARTHUR E. WALSH, OF CHICAGO, ILLINOIS.

HAIR WAVE.

Application filed May 10, 1924. Serial No. 712,192.

This invention relates to hair wavers and more particularly to improvements in hair wavers of the type illustrated and described in my co-pending application, Serial No. 712,193, filed May 10, 1924.

The invention is illustrated in accompanying drawings in which;

Figure 1 is a vertical sectional view of an embodiment of the invention;

Fig. 2 is a vertical section on line 2-2 of Fig. 1;

Fig. 3 is an isometric view of one of the former and heating units showing its mounting, the means for operating it and the means for locking the unit in the positions into which it is moved;

Fig. 4 is an isometric view of the upper former shell or casing showing the mounting and operating means for the former and heating units and the latch means for the lower former blades and for the upper former operating means;

Fig. 5 is a fragmentary isometric view of the lower former member and retaining means showing the crest combs and blades swung apart into open position; and

Fig. 6 is a fragmentary elevational view of the hinged ends of one of the lower former blades and comb elements.

The device comprises a lower former and comb element designated generally at 5 and a cooperating upper former and heater designated generally at 6.

The former 5 comprises the spaced relatively thin metal blades 7 carried by blade frames 8 which are rigidly attached through angle brackets 9 to a back 10. The back 10 is of arcuate or curved formation and the attachment of the blades thereto is such that the blades lie radially in spaced relation to each other giving their lower edges an arcuate contour to conform generally to the shape of the head so that the device may be applied closely to the head with the lower edges of the blades in close proximity thereto. The back 10 is hinged at 12 to the back 13 of the crest comb element 14.

Comb element 14 comprises relatively thin flat combs 15 rigidly attached to back 13 by means of brackets 16 and provided along their lower edges with depending teeth 17. The combs 15 are spaced apart to lie superposed above blades 7 and parallel with and in the respective planes of said blades with the lower ends of teeth 17 upon the upper edges of blades 7 when the blades and

combs 15 are closed with respect to each other. Integral lugs 18 on blades 7 are adapted to cooperate with the lower edges of combs 15 beyond the inner ends of teeth 17 to form bearings for the combs upon the blades at that point. An angle piece 20 extends across and connects the outer or free ends of combs 15. Rigidly attached to the back 10 with the lower leaf of hinge 12 is a handle 15'. Springs 21 connected between the blade and comb members normally hold said members yieldably closed. For swinging them away from one another to the open position of Figures 5 and 6 for the introduction of the strands of hair therebetween, the back 13 has a finger piece 23 rigidly attached thereto. Suitable insulating strips 25 preferably extend along the lower edges of each blade 7 as shown in Fig. 2, for the purpose of protecting the scalp from the heat of the device when it is applied closely thereto.

The upper former and heater has an open bottomed cover or casing 28, the opposite ends of which are slotted vertically from their lower edges as shown at 30 and 31 in Fig. 4 to fit down over the combs 15 and blades 17. The opposite ends of each blade have square apertures 32 therethrough and for locking the shell or cover 28 down upon the lower former and comb elements in the position shown in Fig. 1 latch bars 34 and 35 are slidably mounted upon the opposite end walls of the shell 28. Each latch bar has apertures 36 and 37 elongated in the direction of sliding movement of the bars and pins 38 and 39 secured to shell 28 extend through these slots and one or both of said pins may be headed at their outer ends as shown in Fig. 4. The pins 38 and 39 carry the arms 34 and 35 and form stop and guides therefor.

Each bar 34 and 35 has an end 40 turned out at right angles thereto and forming a finger piece for conveniently releasing the latch. Integral latch fingers 42 depend adjacent the positions assumed by the opposite ends of the blades 7 when the cover or shell 28 is positioned thereon and the lower ends of these latch fingers 42 have detents 43 which engage in the square apertures 32 of the blade members, and thereby clamp the blades 7 and combs 15 closed, and the cover of the upper former and heater firmly in place upon the lower former and comb elements. The latch bars 34 and 35 are normally yieldingly urged to their latch-

ing positions by springs 45 connected at one end to the latch bars and at their opposite ends to the pins 38 on the ends of the shell 28. To remove the shell 28 and upper  
 5 former and heater from the lower part of the device the latch bars 34 and 35 are moved slidably against the tension of springs 45 to their unlatched position and the upper and lower parts of the device are separated  
 10 by relative movement in the vertical direction of slots 30 and 31.

The upper former proper comprises a plurality of independent former and heater units 50 each having a shell 51 (Fig. 2) of  
 15 sheet metal or other suitable material having a rounded bottom 52 and a flat top 53. Housed within each shell 51 are suitable independent heating elements 54 which may be in the form of resistance coils or units  
 20 having conductors for connection with the usual socket or outlet or with any other suitable source of current. Each former unit 50 is mounted and actuated separately or independently and the heating elements 54  
 25 are obviously independently mounted and housed. The opposite ends of each shell 51 have integral projecting ears or lugs 58 (see Fig. 3) turned inwardly and then outwardly in parallel spaced relation.

30 For supporting and imparting shifting movement to the units 50 alternately in opposite directions, as will hereinafter appear, the shell 28 has rigidly attached to one end wall adjacent one end of each unit 50 a  
 35 bracket 60 and to the opposite end wall adjacent the opposite end of each unit a bracket 62. Each bracket 60 and 62 has a flange extending between the ends of lugs 58 and each of said flanges has inclined  
 40 slots 64 through which pins 65 extend and are secured in ears 58. The slots 64 are inclined in opposite directions at the successive units 50 so that the successive units will be shifted in opposite directions as will  
 45 hereinafter appear. The opposite inclination of the slots 64 at the respective units is shown in Fig. 4.

Mounted upon the upper flat surface 53 of each unit 50 substantially centrally between  
 50 its ends is a bracket 68 having a pin 69 on which is rotatably journaled a roller 70. Mounted for rectilinear shifting movement or reciprocation on the upper wall of shell 28 is a plate 72 having depending marginal  
 55 flanges 73 and carried by, for movement with, said plate 72, is a heater unit actuating cam member 74. The upper wall of shell 28 has an elongated opening 75 and a rivet 76 passes through the upper wall  
 60 of cam member 74 and through plate 72 and opening 75 and projects upwardly therefrom. A plate 77 is secured upon pin 76 and overlies the upper wall of shell 28 and the cam member 74 and plate 72 are  
 65 thereby mounted upon said wall. A bar

200 secured between the plates 72 and 77 fits slidably in the opening 75 and guides the carriage in its movement therealong.

The cam member 74 has depending walls 78 provided at their forward ends with out-  
 70 wardly turned ears 79. Each wall 78 has an inclined cam slot 80 inclined upwardly to the forward ends of the cam member 74 and extending out into the ears 79. The  
 75 rollers 70 on alternate units 50 face in opposite directions those facing in one direction being adapted to engage in the cam slot 80 in one wall 78 and the alternate  
 80 rollers which face in the opposite direction being adapted to engage in the cam slot 80 in the opposite wall 78. The rear ends of walls 78 have ears 82 turned out at right  
 85 angles thereto and the slots 80 extend out into said ears so that the rollers 70 will be freed from the cam member 74 at the rear end thereof. The depending walls 78 of  
 90 the cam member 74 are not only inclined downwardly toward the rear lugs 82 but are spread outwardly toward said rear lugs. The downward inclination of the slots in  
 these walls 78 depresses the members 50 and the outward spread allows for the shifting of members 50, which accompanies said depression.

From the foregoing it is now apparent  
 95 that with the cam member 74 and plate 72 at the right-hand side (Fig. 4) of the shell 28, shifting of the cam member 74 will cause successive engagement of the slot 80 in one  
 100 wall 78 with alternate rollers 70 with an accompanying successive engagement of the cam slot 80 in the other wall 78 with the rollers 70 on the devices between said first  
 105 alternate devices and a resulting successive depression of units 50 into nested position between combs 7 as shown to the right in  
 Fig. 2. Simultaneously with the successive depression of units 50 the engagement of  
 110 pins 65 with the opposite inclined slots 64 imparts a longitudinal shifting movement to units 50 alternately in opposite directions. The rearward spreading of the walls 78 is to  
 allow for the shifting movement of the former and heater units which accompanies  
 115 their depression.

For the purpose of locking the units 50 in their depressed and raised positions the  
 brackets 62 have offset from their upper  
 120 ends inwardly projecting integral fingers 85. Pivoted on each finger 85 is a latch arm 86 in the form of a bell crank lever. Projecting from the inner edge of the depending  
 125 arm of each of said levers 86 is a lug 87, the upper end of which is adapted to engage under pins 65 to lock the unit 50 in raised position as shown in Fig. 3 and when the  
 130 unit is depressed the lower end of said lug 87 is adapted to engage over the pin 65 to lock the unit 50 in depressed position. The arms 89 of levers 86 project inwardly into

the path of movement of flanges 73 and the opposite ends of the lower edges of said flanges 73 are inclined at 90 to cam the levers 86 in a counter-clockwise direction (Fig. 3) as the plate 72 is shifted through the casing in its heater depressing and heater raising movement.

It is to be understood that the latch levers 86 are disposed alternately at opposite ends of the successive units 50. A latch spring 92 on the pivot 93 of each lever 86 normally swings the lever in a clockwise direction into the position shown in Fig. 3. Now as the plate 72 and cam member 74 are shifted to depress units 50 successively as already explained, the inclined forward cam edges 90 engage the arms 89 of levers 86 swinging said levers in a counter-clockwise direction against the tension of springs 92 and thereby releasing the upper ends of lugs 87 from pins 65 to permit the depressing and shifting movement of the former and heater units. As the former and heater units reach their depressed or shifted positions the flanges 73 travel past and release arms 89 permitting the levers 86 to be swung in a clockwise direction by the springs 92 so that the lower ends of lugs 87 will overlies pins 65 and thereby lock the units in their depressed shifted positions. Upon shifting movement of the plate 72 and cam 74 in the opposite direction the inclined cam edges 90 at the opposite ends of flanges 73 engage arms 89 and thereby release latch levers 86 and the cooperation of cam slots 80 with rollers 70 lifts the units 50 successively to their raised positions where the levers 86 are again released and spring into their positions, shown in Fig. 3, to lock the units 50 in raised position. The carriage comprising the plates 72 and 77 and the cam member 74 has a latch bar 96 provided along its edge adjacent the carriage with notches 97 in which notches a detent 98 on the carriage is adapted to engage to lock the carriage in its successive positions. The detent 98 is free on the pin 76 for example, and plays between shoulders 99 which cooperate with a post 100, the detent being normally urged to its latching position as shown in Fig. 4 by means of a spring arm 102. The carriage has a finger piece 105 mounted for example upon the upper end of pin 76.

Mounted upon the shell 28 are a pair of handles 106 normally held in the relative positions shown by a spring 108 interposed between them. The handles 106 are adapted to be grasped and swung toward each other against the tension of spring 108 and the relative swinging motion between them is imparted through an arm 109 and a link 110 having pivotal connection at one end with arm 109 and at its opposite end with latch bar 96, to release the latch bar from its latching engagement with detent 98. By

so releasing the latch bar 96 the cam carriage is freed for movement to the right in Fig. 4 movement to the left past notches 97 being permitted by the play between shoulders 99 of detent 98. A headed post 112 extends through an elongated opening or slot 113 in one end of latch bar 96 and is secured to cover 28 and it is upon this post 112 that the latch bar 96 is actuated in its latching and releasing movements.

With the cover 28 and upper former and heater elements mounted upon the lower blades and comb elements as shown in Fig. 1 the operation of the device is as follows:

The upper part is removed from the lower blades and combs by releasing the latch bars 34 and 35 and separating the two parts as already pointed out. Then by holding the lower blade and comb part by the handle 15 and depressing the finger piece 23 the blades 7 and combs 15 may be swung away from each other about hinge 12 into open position substantially as shown in Fig. 5.

The blades 7 are then arranged through the hair adjacent the head, or where the strands of hair are being waved at a distance outwardly from the head, the blades are arranged beneath said strands, and the hair is arranged over the blades. The free ends of the blades and blade frames are preferably tapered and rounded as shown at 115 to facilitate insertion through the hair. With the strands of hair distributed over the blades 7, the combs 15 are closed, whereupon the teeth of said combs 15 engage the strands of hair and prevent lateral displacement thereof. The cover 28 with the upper heater and former parts is then mounted upon the lower blades and combs and locked in place as already pointed out.

Then assuming that the cam carriage is at the right hand side of the device in Fig. 2, movement of said carriage through the opening 75 to the left will depress the heater and former units 50 successively into nested position between blades 7 and crest combs 15. The units 50 have depending combs 120 which, as the units 50 are depressed, are brought into cooperation with the strands of hair. The cooperation of the crest combs 15 with the blades 7 permits slipping of the strands of hair therebetween in the direction of the length of the strands and at the same time effectively prevents transverse displacement of the strands. Consequently the strands of hair at the crests of the waves longitudinally thereof are held relatively stationary in a lateral direction and the troughs of the strands by reason of their engagement with combs 120 are shifted rectilinearly in opposite directions with the opposite directions of movement of the units 50. This produces the lateral waves in the hair, the nesting of the units 50 between the blades and combs 7 and 15 producing the

waves at substantially right angles to said first waves up over the upper edges of blades 7 and down around the rounded bottoms of units 50 and thereby producing the compound or "Marcel" waving, as is well understood in the art. After the desired wave is produced, the carriage is moved in the opposite direction to raise the units 50 from their depressed waving positions whereupon the cover with the upper heater and former parts may be removed from the lower former member comprising the blades 7 and combs 14 and the device again applied to the unwaved portions of the hair and this is repeated until the desired extent of waving is produced.

It should be noted that as in my aforesaid copending application, the blades 7 instead of presenting a solid or continuous member over the entire waving area are adapted to lie edgewise to the head to present spaced openings through which the strands of hair may be arranged at various points of the waving area and up and between the former and heater units of the device, instead of the necessity of arranging all of the strands into the device from one end. This permits expeditious waving of the strands of hair close to the head and avoids the necessity of arranging the device endwise and the slow and complicated waving of the bases of the strands of hair as heretofore. Of course as the outer ends of the strands of hair are approached the strands may be arranged through the device entirely from one end, although even at these points the spaced openings between the blades may be again brought into use if desirable.

The separate operation of the upper former and heater units of the present device permits of the employment of as great a number of said units as desired without requiring powerful operating leverages or stresses which would be necessary if a great number of units were employed and it was desired to operate them simultaneously. The differences in structure, mounting of the various parts and the other accompanying distinguishing features over my aforesaid application are believed to be obvious from the foregoing description.

I claim:

1. In a device of the class described, the combination with a waving unit of a plurality of independent heating and waving units movable separately and successively into cooperation therewith.

2. In a device of the class described, the combination of a waving unit, comprising a series of combs cooperating blade members and supporting means therefor, a plurality of separate heating and waving units cooperable therewith, and means for moving said units successively into cooperation with said first unit.

3. In a device of the class described, the combination of a plurality of spaced blade members, a plurality of separate heating and waving units, means for moving said units successively into nested position between the blades, and means for shifting the units alternately in opposite directions with their movement into cooperation with the blades, said waving units having means for moving the strands of hair adjacent the waving unit therewith.

4. A Marcel waver including a plurality of longitudinally stationary comb members, a plurality of blade members separable from said comb members to receive strands of hair therebetween and hold same in said comb members, a plurality of former members cooperable with said blade members for producing waves in the strands of hair, and comb members extending longitudinally and centrally only along the under surfaces of the former members, said last comb members being movable longitudinally for producing waves in the strands of hair generally normal said first waves and the former members having bottom former surfaces extending laterally from the sides of said last comb members.

5. In a device of the class described, the combination of a plurality of spaced blades, comb means cooperable with said blades for holding the strands of hair against lateral displacement, waving means comprising former members movable into nested position between the blades for waving the strands of hair, and comb means carried by said waving means and extending longitudinally and centrally only along the under surfaces of the former members and shiftable to produce lateral waves in the strands of hair said former members having bottom former surfaces extending laterally from the sides of said last comb members.

6. In a device of the class described, the combination of a plurality of spaced blade members, a plurality of separate heating and waving units, means for moving said units successively into nested position between the blades, means for shifting the units alternately in opposite directions with their movement into cooperation with the blades, and comb means carried by and shiftable with said units for producing lateral waves in the strands of hair.

7. In a device of the class described, the combination of a plurality of spaced blades, comb means cooperable with the blades for holding the strands of hair against lateral displacement along the blades, a plurality of separate heating and waving units, means for moving said units successively into nested position between the blades, means for shifting the units alternately in opposite directions with their movement into cooperation with the blades, and comb means car-

ried by the units and engageable with the strands of hair between said first comb means, said last comb means being shiftable alternately in opposite directions with the heating and waving units to draw the strands of hair into lateral waves on said first comb means.

8. In a Marcel waver, a former member having a smooth rounded former surface adapted to be pressed against the hair and a comb member extending longitudinally along the center only of said rounded former surface and depending therefrom, said former surface extending laterally from the sides of said comb member.

9. In a device of the class described, a pair of waving units, means operable to bring said units into and out of cooperation, means for locking said units in and out of cooperation, and means operable with the unit operating means for releasing said locking means.

10. In a device of the class described, a waving unit comprising a plurality of spaced blades a plurality of comb members pivoted to said blades and adapted for edgewise engagement therewith and means for waving the strands of hair between said blades and comb members.

11. In a device of the class described, a plurality of spaced blade members arranged radially and in arcuate order to conform edgewise to the head, comb members cooperable edgewise with said blade members for holding the strands of hair against lateral displacement along the blade members, a frame, and a plurality of heating and waving units mounted in arcuate order in said frame for alternate disposition with respect to the blades and depressible radially into nested position between the blades.

12. In a device of the class described, the combination of a plurality of spaced waving units, shiftable cam means for depressing and raising said units, means for shifting the units alternately in opposite directions with said first movement, said units having means engaging in said cam means, said cam means being inclined to impart the desired depression and raising movement and spread to allow for the alternate shifting in opposite directions accompanying said first movement and means for supporting the strands of hair in position to be waved by said units.

13. In a device of the class described, the combination of a plurality of waving members, a cam member movable across said waving members, said cam member having side walls provided with inclined slots, rollers carried by said waving members and engaging alternately in the slots in opposite walls of said cam member for depressing and raising said units with the movement of the cam member thereacross and means

for supporting the strands of hair in position to be waved by said waving members.

14. In a device of the class described, the combination of a plurality of waving members, a cam member movable across said waving members, said cam member having side walls provided with inclined slots, and rollers carried by said waving members engaging alternately in the slots in opposite walls of said cam member for depressing and raising said units with the movement of the cam member thereacross, means for shifting said waving units alternately in opposite directions with said depressing and raising movement, the slotted walls of the cam member being spread to allow for said shifting movement and means for supporting the strands of hair in position to be waved by said waving members.

15. In a device of the class described, the combination of a plurality of waving members, a cam member movable across said waving members, said cam member having side walls provided with inclined slots, and rollers carried by said waving members engaging alternately in the slots in opposite walls of said cam member for depressing and raising said units with the movement of the cam member thereacross, means for shifting said waving units alternately in opposite directions with said depressing and raising movement, the slotted walls of the cam member being spread to allow for said shifting movement, means for locking said units in their raised and depressed positions, means movable with said cam member for releasing said locking means with the waving unit operating movement of said cam member and means for supporting the strands of hair in position to be waved by said waving member.

16. In combination, a plurality of blade members, combs pivoted to said blade members and adapted for edgewise engagement therewith, a frame adapted to be mounted upon and for locking to said blades, a plurality of heating and waving members mounted in said frame for lowering into and raising from cooperation with said blades and for alternate shifting movement in opposite directions, and a carriage shiftable on the frame operating said heating and waving units.

17. In combination, a plurality of blade members, combs pivoted to said blade members and adapted for edgewise engagement therewith, a frame adapted to be mounted upon and for locking to said blades, a plurality of heating and waving members mounted in said frame for lowering into and raising from cooperation with said blades and for alternate shifting movement in opposite direction, a carriage shiftable on the frame for operating said heating and waving units,

latch means for preventing retraction of said carriage and means for releasing said latch means.

18. In a device of the class described, the  
5 combination of a pair of waving units, means operable to bring said units into and out of cooperation, a pivoted locking arm normally free of said operating means and cooperating with one of said units to lock the units  
10 in predetermined relation and means on said operating means and cooperable with the locking arm to release said arm by the operation of said operating means.

19. A Marcel waver, comprising a plurality of blade members, a plurality of longitudinally fixed comb members pivoted thereto and adapted to be separated to re-

ceive strands of hair between the blade and comb members, a plurality of former members cooperable with said blade members,  
20 comb members carried by said former members and engageable with the strands of hair between said first comb members and means for moving said former members into cooperation with said blade members to form  
25 waves in the strands of hair and for shifting said second comb members longitudinally with respect to said first comb members to form waves in the hair strands generally  
30 normal said first waves.

In witness whereof, I hereunto subscribe my name this 7th day of May, 1924.

ARTHUR E. WALSH



Aug. 31, 1937.

P. L. MOULIN

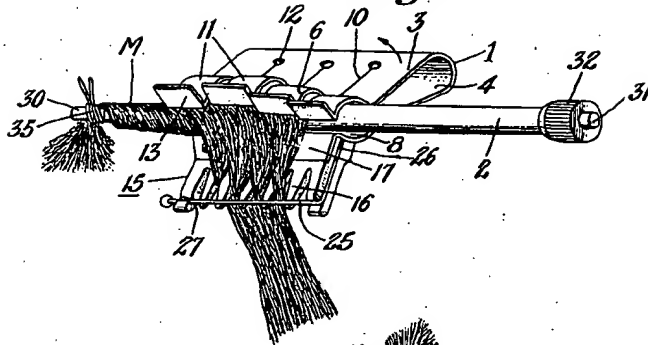
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PERMANENT WAVING

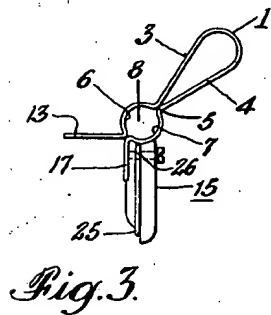
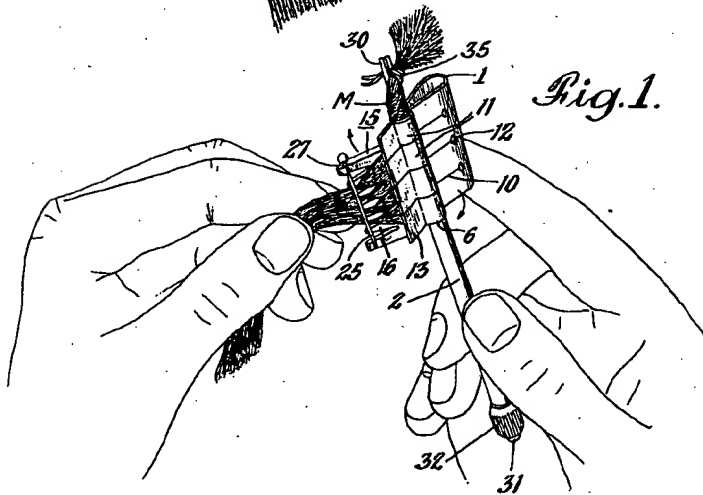
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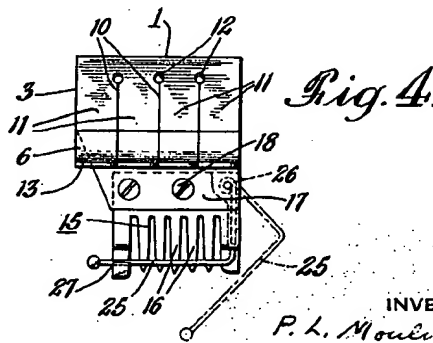
*Fig. 2.*



*Fig. 1.*



*Fig. 3.*



*Fig. 4.*

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2,091,738

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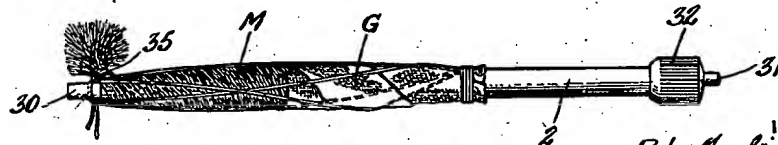
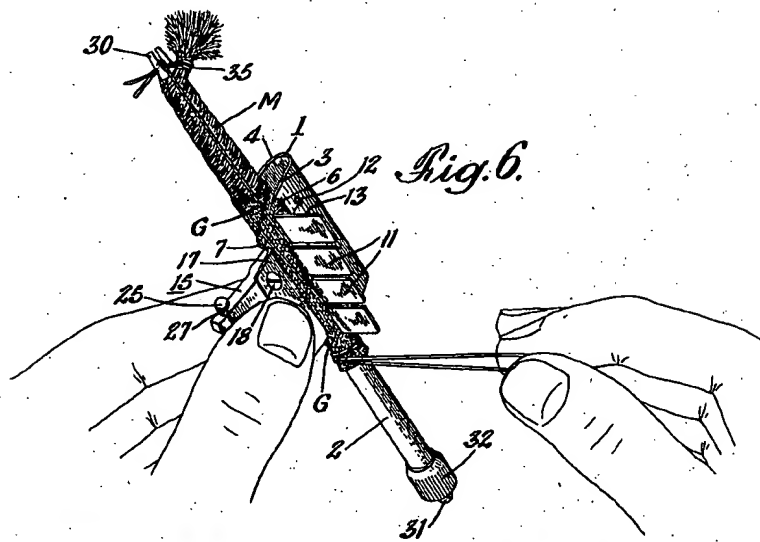
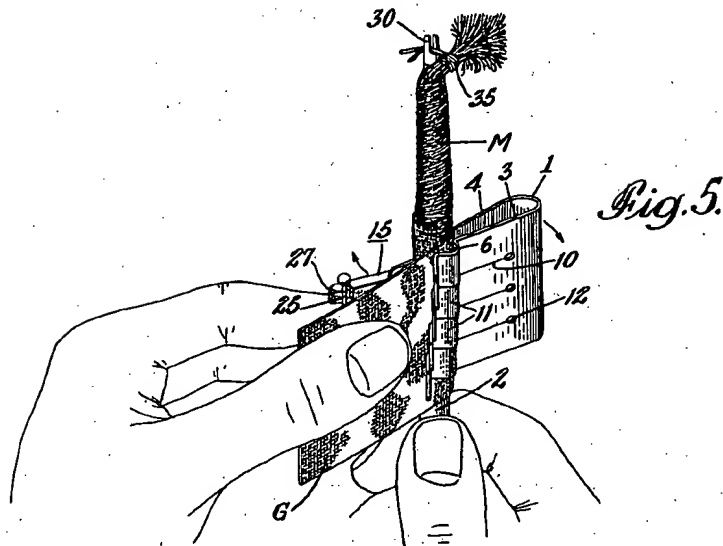


Fig. 7.

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## UNITED STATES PATENT OFFICE

2,091,738

## PERMANENT WAVING

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Application June 27, 1936, Serial No. 87,677  
In France January 17, 1936

21 Claims. (Cl. 132—33)

The invention relates to permanent waving and more especially to novel means for curling or winding tresses of living human hair about a curler preparatory to the usual subsequent steps of the permanent waving process.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a perspective view showing the initial application to a tress of a winding device embodying the invention;

Fig. 2 is a similar view representing progress of the winding operation;

Fig. 3 is an end elevation of a winding device embodying the invention;

Fig. 4 is a side elevation of the device shown in Fig. 3; and

Figs. 5, 6 and 7 show successive steps in the winding and binding of the tress to the curler.

The invention is directed to providing a novel and useful device for assisting the hairdresser in winding or wrapping strands of hair about curlers or curling rods in the process of permanent waving. The invention especially applies to winding the hair in helical formation from the scalp outwardly about a cylindrical curler. An object of the invention is to avoid the need for the major care and skill and strength now employed in so winding hair by hand, while facilitating the production of a curl possessing the characteristics and quality of one wound by the most skilled hairdresser.

The invention provides a very simple, inexpensive and practical winding device which can be used to produce curls of the character desired without the necessity for long and arduous training and experience. By use of the device a relatively inexperienced hairdresser can produce smooth, flat, tightly wound curls having any desired configuration. The device possesses characteristics of flexibility and adaptability in use whereby it may be applied to curls of greatly

varying dimensions without any mechanical adjustment. Furthermore the device is adapted to wind hair of greatly varying strengths, length, fineness and other characteristics, without harming the hair or affecting its strength or vitality. The hair is wound smoothly and uniformly and without danger of being torn or pulled or rendered frizzy by the winding operation. The invention in its capabilities is substantially equivalent to the operation of the human fingers, especially in that the hair is not torn or forced into position by rigid members, but is given a smooth, flexible, wrapping action comparable to that from the fingers of a skilled operator, while exactly the required amount of tension or stretching may be imparted to the hair just as in hand winding. The hair may be wound either wet or dry and in some cases the invention is especially effective in winding previously moistened hair in that the hair treating liquid comes in contact with all of the hairs while the tress itself is wound into a very tight and compact curl.

In addition to the foregoing advantages, the device of the invention enables the hair to be maintained in a natural position throughout the entire winding operation, thereby conducing to proper winding and to the comfort of the customer. Moreover the operator can impart any desired degree of pitch or overlap to the curl, just as in winding by hand, in order to produce the desired conformation and to accommodate the curling action to the particular quality and characteristics of the hair and to the type of wave desired. The device also is usable with tresses of any practical length. Also the operator can utilize the device either for winding all or any selected part of the tress, it being possible to wind other portions thereof by hand if desired.

The invention further facilitates the fastening of the wound curl to the curlers and maintaining it in the wound and tensioned condition throughout the waving process. The winding device itself is usable successively on the several curls of a head, being readily removable from the tress and curler after the winding operation is finished. In accordance therewith the invention comprises a novel method of fastening or binding the wound tress to the curler to hold the curl in position after the winding device is removed.

Broadly described, the winding device comprises an integral U-shaped clamp of resilient material the jaws of which can be opened to rotatably grip the curler while extending transversely therefrom. One jaw or pressing arm of the

clamp is sub-divided to form a plurality of independently resilient tongues or fingers which act to smooth and wrap the tress about the curler and to accommodate the winding to the varying thicknesses and positions of the tress. The construction described gives to the winder an operating effect substantially identical with that of the fingers of a skilled hairdresser, while greatly reducing the skill, strength and care required in hand winding. The winder is readily detachable from the curler and may be applied thereto at any point. Preferably a comb or the like is connected to one jaw of the clamp and acts to straighten and prepare the hair for the wrapping and pressing operation of the winding fingers.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred embodiment of the invention illustrated by way of example in the accompanying drawings, the winder comprises a bifurcated clamp or gripper of substantially U-shape and formed of a single piece of flat, spring metal stock. The back or bent, axial portion 1 of the clamp is rounded and is of an interior diameter substantially equal to that of a curling rod 2 to which the clamp is to be applied. The two branches, arms or jaws 3 and 4 of the clamp converge almost to contact with each other along a line 5 substantially parallel to the back or axial edge 1 of the clamp. Beyond the line 5 the upper jaw 3 is recessed or bowed out at 6 to form a semi-cylindrical recess, while the lower jaw 4 is similarly recessed at 7 in the opposite direction. It will be clear that the complementary recesses 6 and 7 together form a tubular sleeve or cylinder 8 which is normally closed by the spring action of the jaws and when closed is of a diameter slightly less than that of the curling rod 2 at its narrowest point.

In accordance with the invention, at least one branch or jaw of the winder is subdivided to form a plurality of resilient wrapping and pressing fingers for the hair. As shown the upper jaw 3 is provided with a plurality of parallel slots 10 extending from the free edge of the jaw toward the back edge 1 of the clamp. As shown the upper jaw 3 is thus subdivided into four semi-independent spring fingers or tongues 11, although it will be understood that the invention is not limited to any specific number of said fingers nor need they be of equal widths or lengths. The slots 10 stop well short of the rear edge 1 of the clamp and may be formed with enlarged holes 12 at their ends to prevent tearing of the metal.

The leading edge of the upper jaw 3 preferably extends beyond the tubular recess 6 and as shown at 13 is flared upwardly and away from the curler channel 8. This construction facilitates the introduction of the curler 2 into the channel 8 and further provides the fingers 11 with hair engaging and smoothing surfaces which facilitate the wrapping action and prevent the escape of stray hairs from the jaws of the winder.

In accordance with the invention means are preferably, but not necessarily, provided for straightening, smoothing and guiding the hair just prior to its engagement by the wrapping and tensioning jaws of the winder. As embodied a comb 15 having parallel teeth 16 is mounted to extend from the sleeve edge of the lower jaw 4 of the clamp. As embodied said lower jaw has an extension 17 projecting beyond the tubular recess 7 and flared downwardly and outwardly in a di-

rection opposite to that of the portion 13 of the upper jaw. The comb 15 is fixed to said extension member 17 to lie therebeneath and project parallel therewith from the lower jaw. Suitable screws, rivets, or the like 18, may be used for attaching the comb to the member 17.

The invention provides means for releasably guarding or retaining the tress of hair within the confines of the comb teeth. As embodied, a bar 25 is adapted to lie across the leading edge of the teeth and to be movable therefrom to permit introduction and removal of hair. As shown, the bar 25 is an L-shaped piece of spring wire and the fixed end 26 thereof is pivotally mounted at the inner edge of one end of the comb. The free end of the bar is adapted to lie in a suitable recess along the end of the comb teeth and to be held behind an undercut tongue 27 formed at the end of the last comb tooth. The bar is formed of a fairly stiff resilient wire or the like so that it may be forced and held in position behind the tongue 27.

In use, the winder hereinbefore described is applied to a cylindrical curling rod or curler 2 which may be of any desired or known form used for helical, root-to-point winding of the hair. As shown the rod is provided with a forked head 30 which is rotatable relative to the main barrel 2 for purposes of tightening the hair after winding. The conventional tightening means is indicated by the axial rod 31 connected to the forked head 30 and the knurled tightening handle 32 by means of which the head 30 may be turned relative to the barrel 2 in either direction and held in the tightened position. However, the invention is not limited to use with such a curler as it will be found in practice that in many cases the winder itself will sufficiently stretch and tension the hair as to permit it to be used with a simple, one-part curler.

The successive operations in the use of the winder are indicated in Figs. 1, 2 and 5 to 7. The tress or strand of hair M is first bound tightly to the forked head 30 of the curler at a point close to the scalp by means of binding cord 35 or by any other suitable means. The operator then firmly grips the tress and gives it a half turn or more about the curler just above the head 30 in the usual manner. Having thus started the winding operation, the winder 1 may then be applied to the hair by forcing the curler and the hair thereon between the flared jaws of the winder so that the curler becomes seated in the tubular recess 8 where it is firmly gripped by the spring action of the jaws. The free portion of the tress may then be laid through the teeth of the comb 15 as indicated in Figs. 1 and 2, the bar 25 being temporarily released and then replaced for that purpose.

Fig. 2 represents the progress of the winding operation after several turns of the winder have been made. The winding action itself is performed very readily by the index finger of the right hand of the operator holding the curler as indicated in Fig. 1. As will be seen the side-by-side fingers or tongues 11 of the winder carry the hair around the curler wrapping it tightly and smoothly thereagainst. The pitch or taper of the helical curl may be determined entirely by the operator so that the winder may be permitted to progress outwardly along the curler relatively rapidly or may be caused to rotate in place so as to give a full or partial overlap to the hair. It will be clear that one part of the tress may be wound with a considerable pitch

while another part, for example the ends, may be wound circularly to give a full ringlet end. With some hair it may even be desirable to reverse the direction of the helix near the end of the curl and the winder permits that operation to be carried out because of its complete freedom from mechanical connection to the curler.

It will be clear that the initial pitch of the curl may be controlled to considerable extent by the positioning of the free portion of the tress in the comb teeth. Thus if a closely wound curl with little pitch is desired the hair will be placed in the comb teeth near the scalp, while a greater pitch or lead will be provided by placing the tress farther along in the comb. It will be observed that the spring fingers 11 not only place and wrap the free part of the tress about the curler, but act thereafter to smooth and flatten the wound hair. As shown in Fig. 2, for example, the fingers 11 nearer the scalp act to override and flatten out and compress the wound tress to give a smooth and continuous wrap thereto, while the central fingers are performing the major work of wrapping the tress about the curler as it feeds in from the comb, while the upper or right hand finger tends to keep the tress from creeping up along the curler and to thereby prevent stray hairs from escaping or being unevenly wound. Thus the independent spring action of each of the winding fingers enables the device to give a smooth, continuous and effective winding action to an even greater extent than the thumb and fingers of a skilled hairdresser, as the spread and "follow-through" of the relatively flexible metal fingers permits them to perform the successive operations on the different parts of the curl. The winder is thus adapted to a great variety of shapes and sizes of tresses, handling long delicate hair or short, stiff clubby locks with equal facility.

After the tress has been substantially completely wound the winder is adapted to complete the rolling up and fastening in of the ends and stray pieces of hair by intertwining with the hair a piece of gauze, tape, crepe wool or the like. As indicated in Fig. 5, a piece of gauze G is laid between the jaws of the winder overlying the comb and extending along the curler at either side of the winder. The operator firmly grips the outer end of the tape against the curler with the thumb of the right hand, while the other end is held against the curl by the fingers of the left hand. Upon rotating the winder the gauze is wrapped in and around the curl and thus firmly binds the upper part of the hair and completes the wiping and wrapping action of the device so that the terminal portions of the hair are given a final wrap which prevents their escape or straightening out.

As the final step in fixing the wound and wrapped curl to the curler so as to retain the stretch and conformation imparted to it by the winding operation, the invention embodies a novel method of so fixing the curl. As shown in Fig. 6 an endless band, preferably a rubber band, is looped or caught at the scalp end of the curler. The band is then stretched the length of the curl between the open jaws of the winder and wrapped tightly several times around the curler just above the upper edge of the winder. The free end of the band is then drawn down along the curl again, between the jaws of the winder, and looped about the scalp end of the curler. Thus both ends of the curl and the entire length thereof are firmly and resiliently bound by a single con-

tinuous binding member. The winder may then be slipped off the curl by forcing apart the jaws and used to wind succeeding tresses. The completely wrapped and bound curl is shown in Fig. 7 ready for the application of the sachet and heater and/or other usual steps in the permanent waving process.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof.

2. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof and a tubular recess formed between said branches and extending along the curler whereby the curler is substantially enclosed between said branches.

3. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, at least one of said branches being recessed beyond its free end to form a substantially tubular seat for the curler between the branches.

4. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, at least one of said branches being recessed beyond its free end to form a substantially tubular seat for the curler between the branches and extending axially of the curler.

5. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, one of said branches being divided to form a plurality of resilient fingers lying side-by-side along the curler.

6. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, one of said branches being divided to form a plurality of resilient fingers extending transversely to the curler and lying side-by-side along the curler.

7. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, at least one of said branches being recessed beyond its free end to form a substantially tubular seat for the curler between the branches, one of said branches being

divided to form a plurality of resilient fingers lying side-by-side along the curler.

8. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, at least one of said branches being recessed beyond its free end to form a substantially tubular seat for the curler between the branches, one of said branches being divided to form a plurality of resilient fingers extending transversely to the curler and lying side-by-side along the curler.

9. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof and a comb for the hair extending from one of said branches.

10. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising an integral bifurcated member of resilient material, the branches thereof being separable to receive and grip the curler while extending transversely thereof, one of said branches being divided to form a plurality of resilient fingers lying side-by-side along the curler and a comb extending from the other of said branches.

11. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a sleeve for embracing the curler and movable around and axially of the curler to wrap and compress a strand of hair in a helical curl thereupon, said sleeve comprising a plurality of gripping fingers disposed side-by-side and extending transversely to the curler.

12. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a sleeve for embracing the curler and movable around and axially of the curler to wrap and compress a strand of hair in a helical curl thereupon, said sleeve comprising a plurality of resilient gripping fingers disposed side-by-side and extending transversely to the curler.

13. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a resilient, U-shaped sleeve for embracing the curler and movable around and axially of the curler to wrap and compress a strand of hair in a helical curl thereupon, said sleeve comprising a plurality of resilient gripping fingers disposed side-by-side and extending transversely to the curler.

14. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a sleeve for embracing the curler and movable around and axially of the curler to wrap and compress a strand of hair in a helical curl thereupon, said sleeve comprising a plurality of gripping fingers disposed side-by-side and extending transversely to the curler and a comb connected to the side of the sleeve opposite said fingers.

15. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a plurality of resilient fingers adapted

to lie side-by-side against the curler to press the hair thereagainst and a comb attached to the device for engaging the hair before it passes beneath said fingers.

16. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a plurality of resilient fingers adapted to lie side-by-side against the curler to press the hair thereagainst and a comb attached to the device for engaging the hair before it passes beneath said fingers, said comb having a releasable guard for holding the hair between the teeth of the comb.

17. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a U-shaped, integral clamp of resilient metal having jaws normally urged together and forceable apart to receive and grip the curler to press and wind a strand of hair thereupon, one jaw of the clamp being divided to form a plurality of side-by-side tongues having limited independent resilient movement toward and away from the opposite jaw.

18. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a U-shaped, integral clamp of resilient metal having jaws normally urged together and forceable apart to receive and grip a curler to press and wind a strand of hair thereupon, the axis of said jaws extending in the same direction as the curler, one jaw of the clamp being divided to form a plurality of side-by-side tongues having limited independent resilient movement toward and away from the opposite jaw.

19. As an article of manufacture, a device for winding growing hair about a cylindrical curler comprising a U-shaped, integral clamp of resilient metal having jaws normally urged together and forceable apart to receive and grip a curler to press and wind a strand of hair thereupon, one jaw of the clamp being divided to form a plurality of side-by-side tongues having limited independent resilient movement toward and away from the opposite jaw, and a comb projecting from said opposite jaw.

20. In the method of winding a tress on a curler for permanent waving the steps of binding the tress to the base of the curler adjacent the scalp, winding the free portion of the tress helically from the scalp, holding the wound tress temporarily from unwinding, fixing a binding member at the base of the curler, extending said member the length of the curl, fixing it at the top of the curl and reversing it to pass the length of the curl and fixing its free end at the base.

21. In a device for winding growing hair about a curler in combination means rotatively gripping the curler and movable axially therealong to wrap and compress a strand of hair in a helical curl thereupon and a plurality of separately acting members disposed axially along the curler to independently resiliently press different parts of the wound strand thereagainst whereby the device is enabled simultaneously to compress different thicknesses of the strand with substantially equal force.

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## [54] PROTECTION APPARATUS

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[58] Field of Search ..... 132/9, 36, 32 R, 37 R, 132/11 A; 219/225

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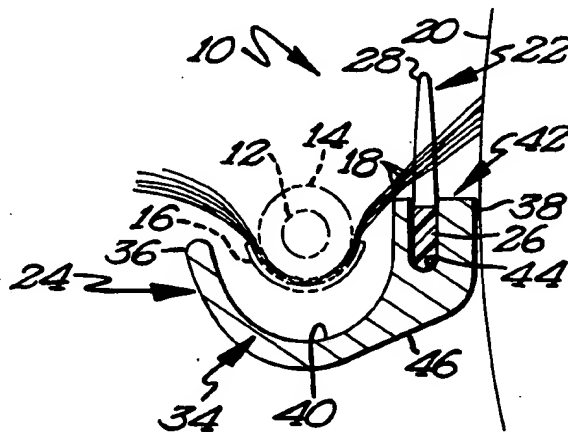
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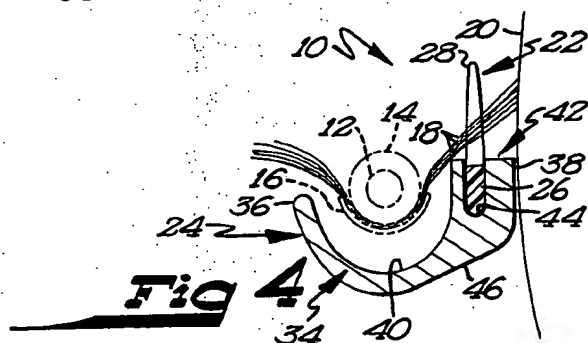
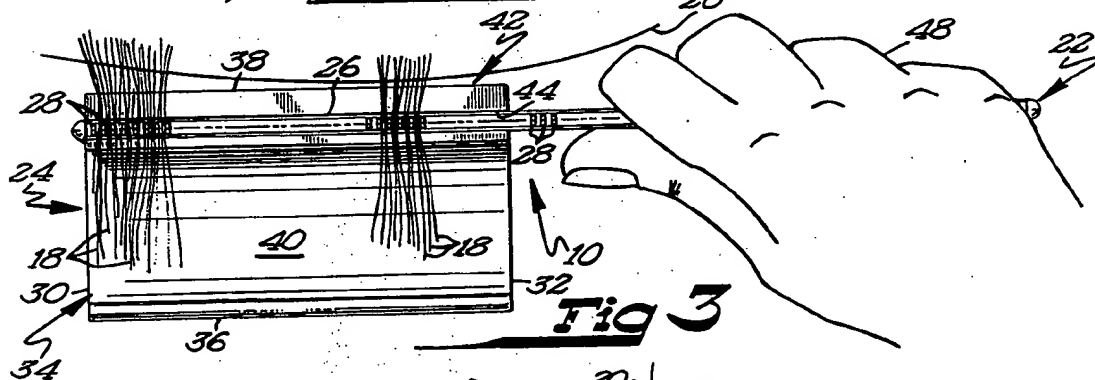
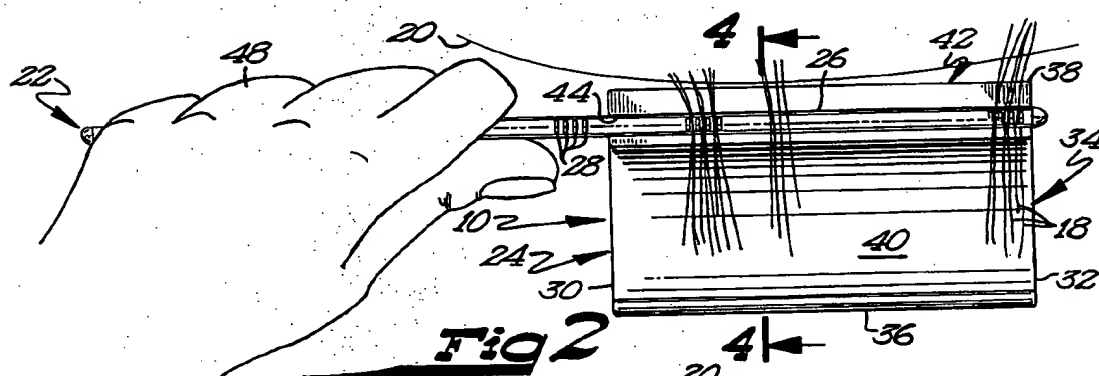
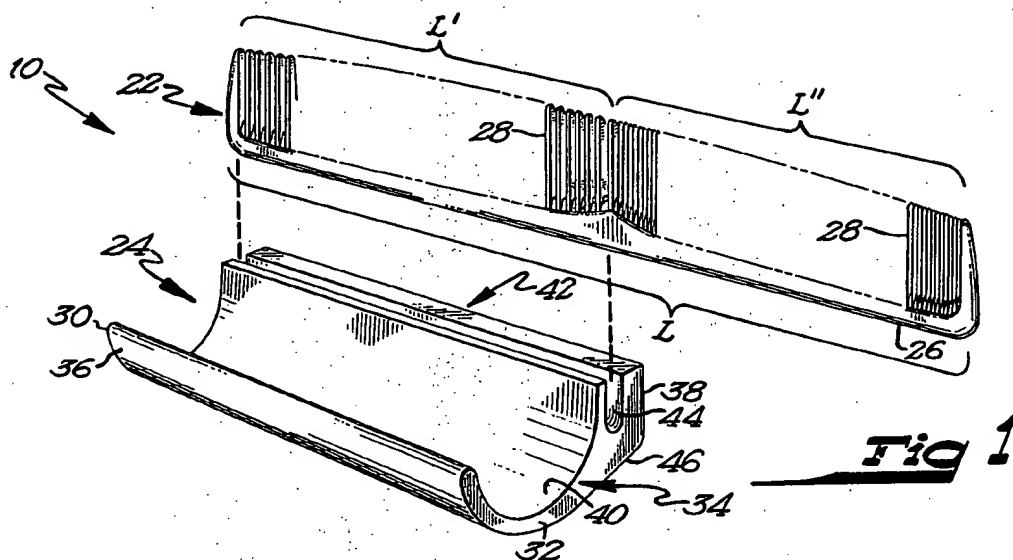
## [57] ABSTRACT

Protection apparatus is disclosed for use with a hair

curling iron having a curling clamp and a heating element. In the preferred embodiment, the protection apparatus includes a guard and a comb retainer. The guard includes a trough member for receiving the heating element and curling clamp of the curling iron to aid in preventing the heating element of the curling iron from accidentally contacting the head of the person desiring their hair curled and a U-shaped slot for removably receiving the back member of the comb allowing a portion of the comb to extend beyond an end of the guard by a sufficient amount to allow the comb to be grasped by the hand of the operator. Therefore the portion of the comb extending beyond the ends can be used as a handle. Further, the comb can be placed either in a first position where the portion of the comb extends beyond the first end of the guard or in a second position where the portion of the comb extends beyond the second end of the guard thereby allowing for righthanded and lefthanded operation of the protection apparatus.

8 Claims, 4 Drawing Figures







## PROTECTION APPARATUS

### BACKGROUND

The present invention relates generally to protection apparatus and more specifically relates to protection apparatus for use with a hair curling iron.

Due to increasing popularity of the natural, curl-type hair styles, the use of curling irons has drastically increased. However, persons utilizing curling irons have been prone to cause burns due to the heating element of the curling iron accidentally contacting the head of the person desiring their hair curled. Therefore, there is a need in the art for an apparatus to aid in preventing the heating element of the curling iron from accidentally contacting the head of the user.

Also since persons use curling irons to curl their own hair, there is a need in the art for an apparatus that can easily be used by individuals themselves to aid in preventing burns caused by the heating element of the curling iron.

Further, there is a need for an apparatus which allows the righthanded or lefthanded operation.

### SUMMARY

The present invention solves these and other problems in hair styling by providing, in the preferred embodiment, a protection apparatus comprised of a guard and a comb. The guard includes a trough member for receiving the heating element and curling clamp of a curling iron to aid in preventing the heating element of the curling iron from contacting the head of the person desiring their hair to be curled and further includes a slot for removably receiving the back member of the comb and for allowing a portion of the comb to extend beyond an end of the guard by a sufficient amount to create a handle which can be grasped by the hand of the operator. Further, the comb can be positioned either in a first position such that the portion extends beyond the first end of the guard allowing righthanded operation of the apparatus or in a second position such that the portion extends beyond the other end of the guard allowing lefthanded operation of the apparatus.

It is thus an object of the present invention to provide novel protection apparatus.

It is a further object of this invention to provide novel protection apparatus for use with a curling iron.

It is further an object of the present invention to provide such novel protection apparatus which is easy to fabricate.

It is further an object of the present invention to provide such novel protection apparatus which is easy to use.

It is further an object of the present invention to provide such novel protection apparatus which allows either righthanded or lefthanded operation.

It is further an object of the present invention to provide such novel protection apparatus which can also be used by persons curling their own hair with a hair curling iron.

These and further objects and advantages of the present invention will become clearer in light of the following detailed description of an illustrative embodiment of this invention described in connection with the drawings.

## DESCRIPTION OF THE DRAWINGS

The illustrative embodiments may best be described by reference to the accompanying drawings where:

FIG. 1 shows an exploded perspective view of the protection apparatus according to the teachings of the present invention.

FIG. 2 shows a top view of the apparatus of FIG. 1 in its lefthanded operation.

FIG. 3 shows a top view of the apparatus of FIG. 1 in its righthanded operation.

FIG. 4 shows a sectional view of the apparatus of FIG. 1 according to the section line 4—4 of FIG. 2.

Where used in the various figures of the drawings, the same numerals designate the same or similar parts in the protection apparatus. Furthermore, when the terms "right", "left", "front", "back", "vertical", "horizontal", "first end", "second end", "lefthanded", "righthanded", and similar terms are used herein, it should be understood that these terms have reference only to the structure shown in the drawings as it would appear to a person viewing the drawings and are utilized only to facilitate describing the invention.

### DESCRIPTION

In the figures, a preferred embodiment of a protection apparatus of the present invention is shown and generally designated 10. Protection apparatus 10 is used in conjunction with a hair curling iron, not fully shown, of the standard type including a heating element 12 shown in the preferred embodiment as having a circumference 14 and including a curling clamp 16 for clamping hair 18 from the head 20 of the person desiring their hair curled between clamp 16 and heating element 12.

Protection apparatus 10 shown includes a comb 22 and a guard 24. Comb 22 includes a back member 26 and a multitude of teeth 28 upstanding from back member 26. Back member 26 is of a length generally indicated L and includes a substantial portion generally indicated L' and a remaining portion generally indicated L''. Back member 26 has a substantially uniform width through the substantial portion L' with the width of the remaining portion L'' being equal to or less than the width of the substantial portion L'. In the preferred embodiment, the width of the remaining portion L'' is slightly less than the width of substantial portion L'.

Guard 24 has a body having a first end 30 and a second end 32 and is of a length which is shorter than the length L of comb 22 by an amount sufficient to allow comb 22 to be grasped by the hand of the operator, as will be explained further hereinafter. In the preferred embodiment, the length of guard 24 is substantially equal to substantial portion L' of comb 22. First end 30 and second end 32 are shown in the preferred embodiment as being flat to allow ease of manufacture.

Guard 24 also includes a trough member 34 having a first side member 36, a second side member 38, and a curved bottom portion 40 therebetween. Trough member 34 should be of a sufficient size to receive heating element 12 and curling clamp 16 of the curling iron and to substantially surround the circumference 14 of heating element 12 to aid in preventing heating element 12 from contacting head 20 of the person as best seen in FIG. 4 and will be explained further hereinafter. In the preferred embodiment, the thickness of second side member 38 is substantially greater than the thickness of first side member 36 to insure that heating element 12

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will be positioned at a substantial thermal distance away from head 20 of the person desiring their hair curled, as will be explained further hereinafter.

Second side member 38 further includes a member 42 for removably receiving back member 26 of comb 22. member 42 includes a U-shaped slot 44 which extends through guard 24 from first end 30 to second end 32 having a width which is substantially equal to but less than the uniform width of substantial portion L' of comb 22. Therefore comb 22 can either be positioned in a first position as shown in FIG. 2 or in a second position as shown in FIG. 3.

In the first position as shown in FIG. 2, back member 26 of comb 22 is located within U-shaped slot 44 of guard 24 such that comb 22 extends beyond first end 30 of guard 24. In this first position, the portion of comb 22 which extends beyond guard 24 forms a handle on first end 30 of guard 24 which may be grasped by a hand 46 of the operator.

In the second position as shown in FIG. 3, back member 26 of comb 22 is located within U-shaped slot 44 of guard 24 such that comb 22 extends beyond the second end 32 of guard 24. In this second position, the portion of comb 22 which extends beyond guard 24 forms a handle on second end 32 of guard 24 which may be grasped by hand 46 of the operator.

Guard 24 should be formed of heat insulating material to prevent heat from being conducted from heating element 12 of curling iron through guard 24 to head 20 of the person desiring their hair curled. In the preferred embodiment, guard 24 is formed from plastic having a high melting point and having good heat insulating qualities.

In the preferred embodiment of the present invention, back member 26 of comb 22 can be removably received within slot 44 of guard 24 by at least two methods. A first method of placing back member 26 of comb 22 within slot 44 is placing remaining portion L'' of back member 26 into slot 44 and sliding comb 22 until substantial portion L' of back member 26 is located within slot 44. It should be noted that, in the preferred embodiment, the width of remaining portion L'' is less than the width of substantial portion L', therefore, remaining portion L'' can easily be placed within slot 44. However, as comb 22 is slid within guard 24, substantial portion L' of back member 26 will be removably received and captured within slot 44 such that remaining portion L'' of comb 22 extends beyond guard 24.

A second method of placing back member 26 of comb 22 in slot 44 of guard 24 is placing substantial portion L' of back member 26 vertically in line with the entrance of slot 44. Back member 26 can then be forced into slot 44 such that back member 26 is urged into and is removably received and captured within slot 44.

Back member 26 of comb member 22 can be removed from slot 44 by simply reversing one of the methods of insertion previously disclosed. For example, comb 22 can be slid within guard 24 until substantial portion L' of back member 26 is located outside slot 44 allowing back member 26 to be easily removed from slot 44 or back member 26 of comb 22 can be vertically forced from slot 44 which allows comb 22 to be removed from guard 24.

A flat, bottom surface 46 can be provided on trough member 34 of guard 24 to allow protection apparatus 10 to be placed on a support surface such that teeth 28

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of comb 22 will be in a vertical position. Further, due to the large area of bottom surface 46, if apparatus 10 is placed on the support surface such that bottom surface 46 is not parallel to the support surface, apparatus 10 will rock such that bottom surface will rest on the support surface. It should be noted that in such a position, back portion 26 of comb 22 will be spaced from the support surface allowing the fingers of the user to be wrapped around comb 22 without removing apparatus 10 from the support surface. Therefore apparatus 10 can be picked up with one hand leaving the other hand free for holding and operating the curling iron.

#### OPERATION

During the normal use of a curling iron, the ends of hair 18 are captured between curling clamp 16 and heating element 12 of curling iron. The curling iron is then twisted such that hair 18 wraps around heating element 12 and clamp 16. For best results, it is necessary to wrap hair 18 around curling iron until the curling iron is as close as possible to the scalp of the person desiring their hair curled. Therefore, the person is very prone to a burn caused when heating element 12 of curling iron accidentally contacts head 20. Further, curling irons have now become popular for use by persons curling their own hair. Such persons are especially prone to accidental burning since the curling operation is done while the person is observing the operation in a mirror. Since it is hard to judge the distance that the curling iron is from head 20, a self user may particularly misjudge the distance and therefore heating element 12 of curling iron may contact head 20 of the user and result in a burn.

Protection apparatus 10 of the preferred embodiment of the present invention aids in preventing heating element 12 of the curling iron from contacting head 20 of the person desiring their hair curled. It should be noted that the person desiring their hair curled can be the operator of the curling iron and protection apparatus 10 or another person.

After hair 18 has been prepared for curling, comb 22 is placed within guard 24 by either pressing or sliding back member 26 into slot 44, as explained. As also explained, comb 22 can be placed within guard 24 in either the first or second position.

The portion of comb 22 extending beyond guard 24 is then grasped by the operator. The operator, with an upward movement, engages hair 18 with protection apparatus 10 such that hair 18 is combed by teeth 28 and also directs the ends of hair 18 into trough member 34. At this time, the operator can clamp hair 18 between curling clamp 16 and heating element 12 of curling iron. This is accomplished by first separating clamp 16 from heating element 12 and then sliding curling clamp 16 on bottom 40 of trough member 34. Hair 18 is then passed between clamp 16 and heating element 12. When the desired amount of hair 18 is located between clamp 16 and heating element 12, clamp 16 is moved toward heating element 12 thereby clamping the ends of hair 18 therebetween. The curling iron is then twisted in the normal manner thereby wrapping hair 18 around clamp 16 and heating element 12. Simultaneously while the hair is being wrapped around the curling iron, protection apparatus 10 can also be moved upwards such that trough member 34 of guard 24 substantially covers circumference 14 of heating element 12 and curling clamp 16, as best seen in FIG. 4.

Therefore, protection apparatus is always located between head 20 of the person and the heating element 12 and clamp 16 of the curling iron. Therefore, protection apparatus 10 aids in preventing burns to head 20 of the person desiring their hair curled. When the curling iron is located at the desired position, the curling operation of the curling iron can then begin in the normal manner. After the curling operation has been completed, the curling iron can be untwisted while protection apparatus 10 is slowly moved down hair 18 such that trough member 34 of guard 24 substantially covers circumference 14 of heating element 12 and curling clamp 16, as best seen in FIG. 4.

Due to the large thickness of second side member 38 of guard 24, heating element 12 and clamp 16 of curling iron will be spaced from head 20 of the person desiring their hair curled. This spacing resulting from the thickness of the side member 38, insuring that the distance between heating element 12 and head 20 of the person will be above a minimum necessary to thermally insulate the heating element 12 of the curling iron from head 20 thus preventing large amounts of heat transfer therebetween to prevent burning head 20 and to further aid in preventing heating element 12 from accidentally contacting head 20 of the person.

While curling hair 18, it may be desired to change the position of comb 22 within guard 24. For example, if it is desired that the portion of comb 22 extending beyond guard 24 to be towards the front of the person, it will be necessary to change the position of comb 22, as when it is desired to curl hair 18 located on the opposite side of head 20. This can be accomplished by sliding back member 26 of comb 22 out of slot 44 or by forcing back member 26 out of slot 44 of guard 24. Then comb 22 can be repositioned such that back member 26 of comb 22 is located within slot 44 of guard 24 such that the portion extending beyond end 30 or 32 is opposite from the previous position. Therefore, comb 22 can be positioned allowing protection apparatus 10 to be used interchangeably in a right-handed and lefthanded operation.

Comb 22 can be of the standard variety. Since comb 22 is in a removable relation with guard 24, many advantages will become apparent to one skilled in the art apart from the righthanded and lefthanded operation as discussed hereinbefore. For example, protection apparatus 10 has the ability to use different types or varieties of combs 22, such as those with smaller or larger tooth spacing, with a single guard 24. Further if one or more of teeth 28 should break from comb 22, comb 22 can be replaced with another comb for use with guard 24. Further, comb 22 can be molded separately from guard 24.

Now that the basic teachings of the present invention have been explained, many extensions and variations will be obvious to one having ordinary skill in the art. For example, although comb 22 is shown as a standard full-toothed comb, it will be immediately apparent that it can be replaced with a comb of different tooth types or of different comb varieties, such as rat-tail combs.

Thus, since the invention disclosed herein may be embodied in other specific forms without departing from the spirit or the general characteristics thereof, some of which forms have been indicated, the embodiments described herein are to be considered in all respects illustrative and not restrictive. The scope of the invention is indicated by the appended claims, rather than by the foregoing description, and all changes which come within the meaning and range of equiva-

lency of the claims are intended to be embraced therein.

What is claimed is:

1. Protection apparatus for use with a hair curling iron including a heating element having a circumference and a curling clamp where, during use of the hair curling iron, the hair from the head of a person desiring their hair curled is placed around at least a portion of the circumference of the heating element and is pressed between the heating element and the curling clamp, comprising in combination: a comb member having a length and including a back member having a substantially uniform width through a substantial portion of that length, with the remaining portions of that length having a width equal to or less than the width of the substantial portion, and a multitude of teeth upstanding from the back member; and a guard including a body having a first end, a second end, and of a length which is shorter than the length of the comb by an amount sufficient to allow a portion of the comb to be grasped by the hand of an operator and including a trough member having a first side member, a second side member, and a curved bottom portion therebetween and being of sufficient size to receive the heating element and curling clamp of the hair curling iron therein and to substantially surround the circumference of the heating element to aid in preventing the heating element of the curling iron from contacting the head of the person, the second side member including means for removably receiving the back member of the comb comprising: a U-shaped slot having a width substantially equal to but less than the uniform width of the substantial portion of the back member for receiving the back member of the comb to allow the comb to be positioned in a first position and a second position with a portion of the comb forming a handle member where the handle is formed on the first end of the guard in the first position and where the handle is formed on the second end of the guard in the second position so that the comb can be used to comb the hair, to direct the hair into the trough member of the guard member, and for a handle, and the guard aids in preventing the heating element of the curling iron from coming in contact with the head of the person.

2. The apparatus of claim 1, wherein the second side member is of a thickness to insure that the heating element of the curling iron will be thermally insulated from the head of the person desiring their hair curled to prevent large amounts of heat transfer therebetween to prevent burning of the head of the person.

3. The apparatus of claim 1, wherein the U-shaped slot extends through the guard from the first end to the second end thereof.

4. The apparatus of claim 1, wherein the first end and the second end are flat.

5. The apparatus of claim 1, wherein the guard is formed of heat insulating material.

6. The apparatus of claim 1, wherein the apparatus further comprises means for supporting the guard on a support surface such that the teeth of the comb will be in a vertical position and such that the back member of the comb is spaced from the support surface.

7. The apparatus of claim 6 wherein the supporting means comprises a flat surface formed on the trough member of the guard.

8. The apparatus of claim 1 wherein the length of the guard is substantially equal to the substantial portion of the length of the comb.

\* \* \* \* \*

[54] METHOD AND EQUIPMENT FOR  
PLANTING HAIRS IN SHEET-FORM  
NET-LIKE MATERIAL OR THREAD FORM  
BODY

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[22] Filed: Apr. 9, 1973

[21] Appl. No.: 349,128

[52] U.S. Cl. .... 132/5

[51] Int. Cl. .... A41g 3/00

[58] Field of Search .... 132/5, 7, 9, 53, 56;  
112/79.5

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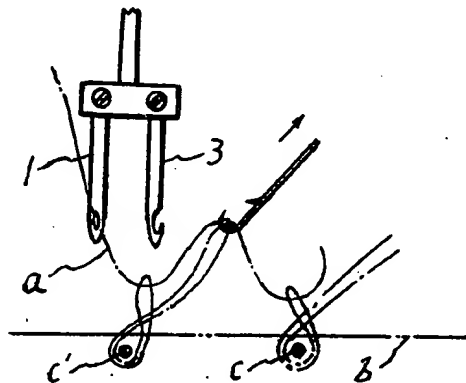
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Primary Examiner—G. E. McNeill  
Attorney, Agent, or Firm—Wenderoth, Lind & Ponack

[57] ABSTRACT

A method and apparatus for planting hairs in a sheet-form net-like material or thread-form body is described. The method is characterized by the step of passing a wound portion of thread-form material from the front face to the back face of a sheet-form net-form material, or thread-form body to thereafter pass from the back face to the front face, taking out the thread-form material exposed on the surface from both ends of the thread-form material after passing through the wound portion, and fixing the thread-form material on a base material by mechanically planting hairs.

4 Claims, 20 Drawing Figures



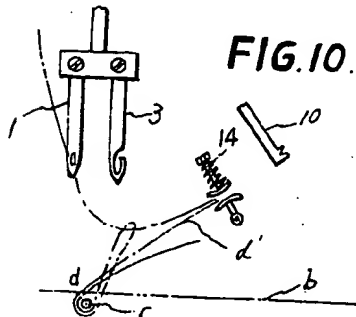
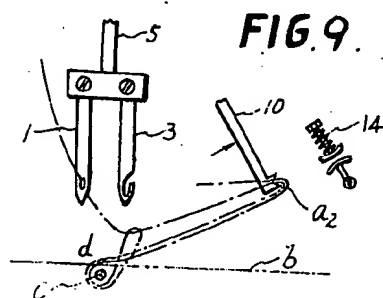
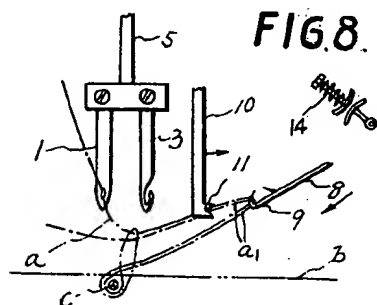
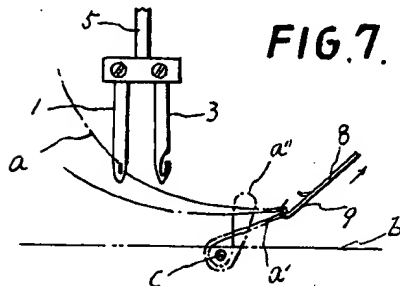
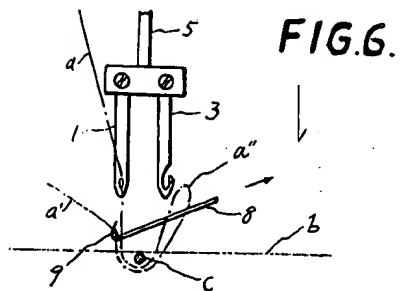
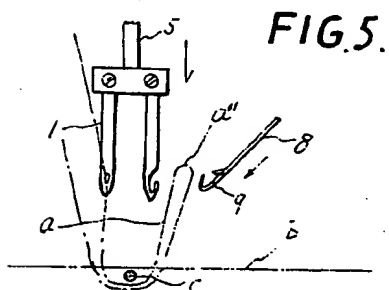
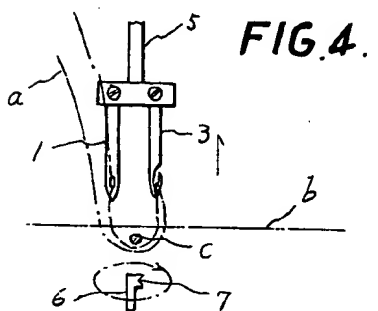
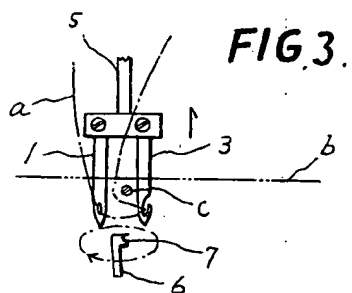
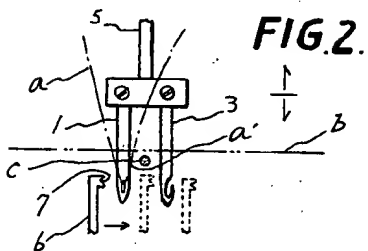
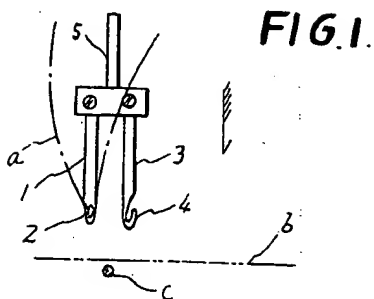


FIG. 11.

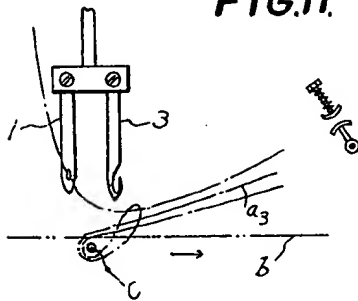


FIG. 12.

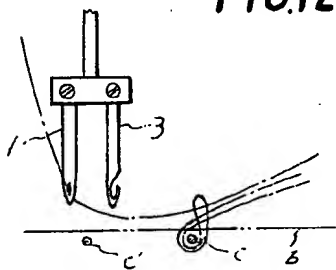


FIG. 13.

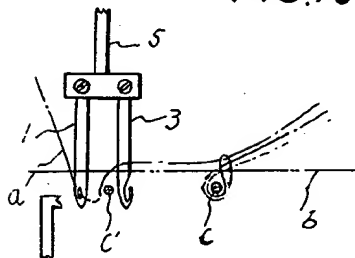


FIG. 14.

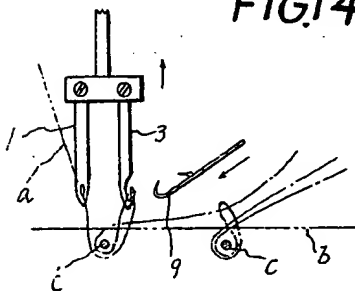


FIG. 15.

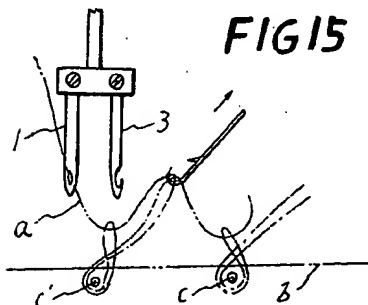


FIG. 16.

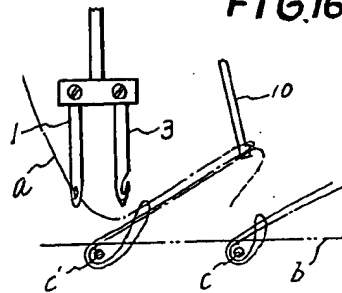


FIG. 17.

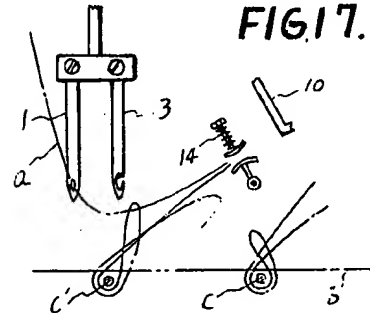


FIG. 18.

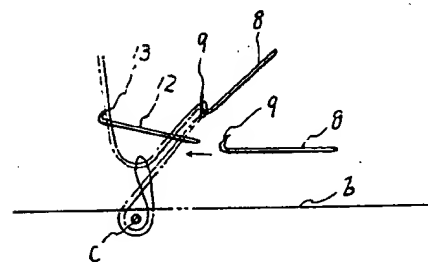


FIG. 19.

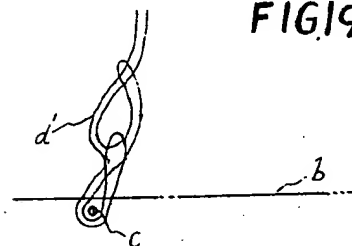
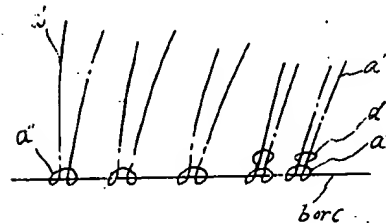


FIG. 20.



# METHOD AND EQUIPMENT FOR PLANTING HAIRS IN SHEET-FORM NET-LIKE MATERIAL OR THREAD FORM BODY

## BRIEF SUMMARY OF THE INVENTION

The present invention relates to a method and apparatus for planting hairs of a net-like sheet material of thread-form material; characterized by planting thread-form material having various lengths in sheet-form base material such as cloth, synthetic resin filmy materials, etc. Wigs and false eyelashes have recently been used widely by reason of demand for simplicity of life and variety of hair style. For production of these wigs, etc., hairy single yarns are manually planted one by one on a base sheet, etc. and, accordingly, much labor and care are required and the products are supplied at high prices because of such labor and care. The means for manufacturing such products with a high efficiency at low cost has not therefore come into existence.

The present invention has succeeded in planting hair mechanically with a high efficiency and removed the aforesaid inconveniences, and the first object of the present invention is to provide a method and apparatus for performing planting of hairs arbitrarily long or short hairs mechanically and with a high efficiency.

The second object of this invention is to provide a method and apparatus for perfectly planting hairs so as not to leave a possibility of separation of the planted hairs.

The third object is to provide a method and apparatus for easily planting hairs not only of short fibers but also of relatively long fibers such as human head hairs.

The fourth object is to provide a method and apparatus for planting hairs not only on a woven cloth surface but also on arbitrary object surface such as sheet-form net-like material or thread-form body.

The fifth object of the invention is to provide a method and apparatus which can be used for all hair planting processes such as hair planting for a wig, hair planting for false eyelash, etc.

## BRIEF DESCRIPTION OF THE DRAWING:

The accompanying drawings illustrate embodiments of apparatus according to the present invention.

FIGS. 1 through 10 are side views showing the actions thereof;

FIGS. 11 through 17 show the second movement after *b* or *c* travels;

FIG. 18 is a side view of an embodiment for double tie-knot;

FIG. 19 is a side view of a double tie-knot;

and FIG. 20 is a drawing showing planting hairs on an object.

## DETAILED DESCRIPTION

The present invention has succeeded in mechanical production, very simply and with a high efficiency by a simple device and method of a hair-planted sheet material forming a wig base material of wig hitherto considered producible by nothing but hand-operated hair planting, and can readily provide hair-planted products beginning with wigs and with long hairs not suitable to usually known pile fabric, thus developing a remarkable effect.

An embodiment of the present invention will herein be described in detail in reference with the accompany-

ing drawings. The reference numeral 1 indicates a sewing needle having a through thread hole 2, and 3 indicates a hook needle having a hook 4 on the end thereof.

These two needles are provided in parallel with a small distance therebetween on the lower end of a reciprocating rod 5. The rod 5 performs ascends and descends by means such as known cam mechanisms. The numeral 6 indicates an under looper which makes a circumventing motion in a definite direction along a definite locus around position reached by the two needles when the needles pass through a sheet material of their object and descend to the utmost, and it has a notch 7. The circumventing movement along a locus may be controlled by an arbitrary cam mechanism of known principle. The numeral 8 indicates an upper looper which, having a hook 9 on its end, performs a reciprocating motion on a slightly elliptical locus in an obliquely right direction by means such as known cam mechanisms and repeats such a motion, approaching the lower end of the two needles 1 and 3, when ascending. The numeral 10 indicates an outside hook, having a notch 11 on its end, which performs a reciprocating motion crosswise within the range of motion of the upper looper 8 by a means such as known cam mechanisms. The numeral 14 designates a trimming device comprising a heater or cutter edge provided near the end of movement of the engaging outer hook 10 and positioned such that the ends of thread hairs can be cut thereby. The letter *a* represents a thread hair, *b* a base sheet-like material, and *c* a thread-like material. The above described mechanism illustrates one unit of apparatus for planting a hair or hairs *a* at a point of the base sheet *b*; in case a large number of such devices are provided in parallel, a corresponding number of hairs may be planted simultaneously. If a large number of devices are provided and operated entire over the width of the base material while the base material *b* is moved intermittently in a definite direction, the work can be completed in a very short time. Further, by providing an auxiliary upper looper 12 in addition to the upper looper in the present equipment, a double tie-knot can be formed so as to produce a further firm hair planting. This double tie-knot may conveniently be used for high quality products as a modified embodiment of the present invention.

When planting hairs by using this apparatus, the hook needle 3 in FIG. 1 further descends as shown in FIG. 6 and the thread become looser. The hook 9 at the end of the upper looper 8 begins to draw back after catching a double thread of a thread hair *a* passing through the sewing needle 1 and a thread hair *a* thereby having a free end. The double thread is then, as shown in FIG. 7, pulled by the hook 9 and folded in four and drawn reversely in a ring-form *a''*.

The upper looper 8 thereafter takes a position for slightly advancing from the extremity of withdrawal. The fourfold thread hair *a*<sub>1</sub> increases its looseness and the engaging outside hook 10 swings, as shown in FIG. 8, to catch the fourfold hair thread *a*<sub>1</sub> with the notch 11 on the end thereof and then rises up while rotating to form a tie knot *d* by pulling as shown in FIG. 9 as well as to cut the folded portion *a*<sub>2</sub> by touching the cutting device. As shown in FIG. 10, there are then formed two threads hairs *a*<sub>1</sub> cut by the tie knot *d* in a fixedly prescribed length. At this time, with the descent of the sewing thread 1, the end passing through the thread

hole of the thread hair a is released and recedes to start the next operation.

Providing the auxiliary upper looper 12 in addition to the upper looper 8 as shown in FIG. 11, the auxiliary upper looper 12 is passed through between the thread hair formed like a ring by hooking with the upper looper 8, and two tie-knots are double formed by further drawing backward the thread end caught with a hook 13, making the tie knot more firm; this is practiced for manufacturing quality products.

What is claimed is:

1. A method for planting thread-like materials in a base material continuously and mechanically by means of a sewing device, comprising the steps of: passing a first looped portion of a thread-like material through the base material from a front to a back surface thereof; subsequently passing the first looped portion, at a point spaced slightly apart from the point at which it first passed through the base material, through the base material from the back surface to the front surface thereof; folding other portions of said thread-like material to form another looped portion at a place where one of said other portions of said thread-like material has a free end; pulling said another looped portion to pass it through the first looped portion so that the folded double thread-like material portions formed by said another looped portion are tied firmly with said first looped portion and with the base material.

2. A method for planting thread-like materials in a net-like material continuously and mechanically by means of a sewing device, comprising the steps of: passing a first looped portion of a thread-like material through the net-like material from a front surface to a back surface thereof; passing the looped portion around the side of the thread-like material which constitutes part of the net-like material; folding other portions of said thread-like material to form another looped portion at a place where one of said other portions of said thread-like material has a free end; pulling said another looped portion to pass it through the first looped portion on the front surface of the base mate-

rial; and further pulling it so that the folded double thread-like material portions formed by said another looped portion are tied firmly with said first looped portion and with the base material.

3. An apparatus for planting thread-like materials in a base material consisting of at least one set, each set comprising: a sewing needle having a through thread hole adjacent the edge thereof; a hook needle having a hook near the edge thereof; an ascending and descending rod on which said sewing needle and said hook needle are positioned in parallel with each other and extend downwardly therefrom; a lower looper adapted to make a circumventing movement on a prescribed locus, said lower looper being positioned adjacent the position of the circumference of the descent ends of both needles; an upper looper adapted to make a circumventing movement and upper looper being positioned adjacent the position of the lower portions of the ascent ends of both needles; and an engaging and disengaging hook adapted to make a transformation movement on a prescribed locus, said engaging and disengaging hook being positioned adjacent to the upper looper.

4. An apparatus for planting thread-like materials in a base material consisting of at least one set, each set comprising: a sewing needle having a through thread hole near the edge thereof; a hook needle with a hook near the edge thereof; an ascending and descending rod on which said sewing needle and said hook needle are positioned in parallel with each other and extend downwardly therefrom; a lower looper adapted to reciprocally move, said lower looper being positioned adjacent the position of the circumference of the descended ends of both needles; an upper looper adapted to reciprocally move, said upper looper being positioned close to the lower portions of the ascent ends of both needles; and an engaging and disengaging hook adapted to move on a prescribed locus, said engaging and disengaging hook being positioned close to the upper looper when the latter ascends obliquely.

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Jan. 3, 1967

J. DORKIN

3,295,534

HAIR THICKENING METHOD

Filed Dec. 17, 1963

FIG. 1



FIG. 2

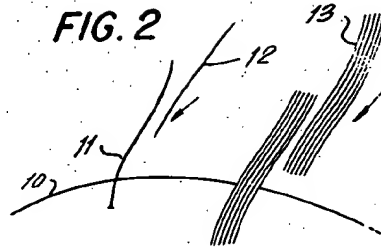


FIG. 3

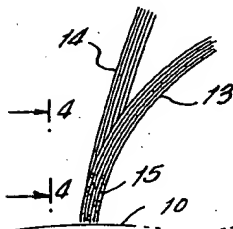


FIG. 4

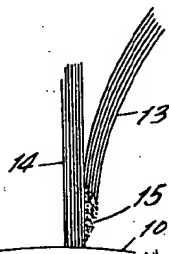


FIG. 5

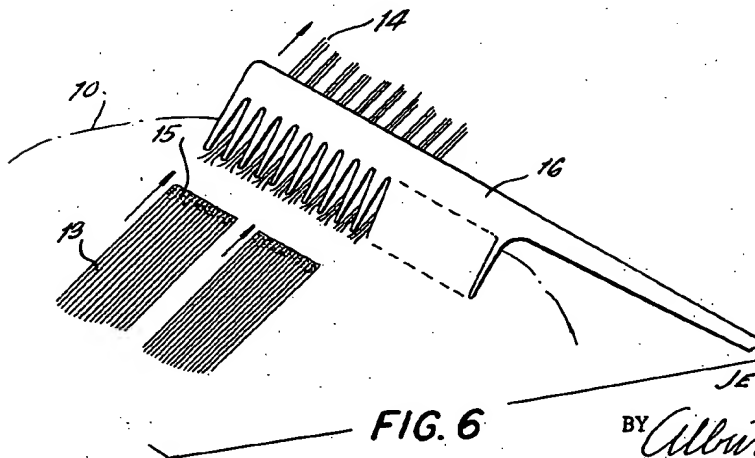
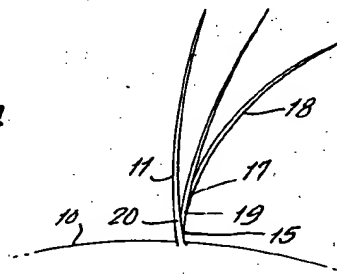


FIG. 6

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3,295,534

## HAIR THICKENING METHOD

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Filed Dec. 17, 1963, Ser. No. 331,145

2 Claims (Cl. 132-5)

This invention relates to apparatus and a process for permanently attaching additional strands of hair to live hair to thicken the amount of hair on a person's head.

It is well known to secure artificial hair pieces to the head by means of adhesives or by physically inter-weaving the said hair piece with the existing hair on a person's head. However, such methods and apparatus either produce an artificial end result or make it impossible for the wearer to comb or wash his hair in the customary manner. In addition, the thickening process achieved by prior art devices is extremely localized and does not present an overall natural appearance.

Accordingly, it is an object of the present invention to provide a means for attaching additional strands of hair to the live hair of a person in a permanent and life-like appearing manner.

Another object of the present invention is to provide a method for thickening the amount of hair on a person's head without interfering with the normal care of said hair.

Another object of the present invention is to provide a method for thickening the amount of hair on a person's head whereby individual areas may be selected for such treatment or an overall distribution of hair may be applied.

A feature of the present invention is the use of strands or groups of strands of hair either natural or artificial which are adhesively secured directly to the existing hair of a person.

Another feature of the present invention is the use of an adhesive which will withstand washing and combing without becoming dislodged from the person's natural hair.

Another feature of the present invention is the use of artificial hair having a plurality of branches whereby a hair thickening effect may be achieved.

Another feature of the present invention is the use of a hair-like structure which may be secured to existing hairs in such manner as to provide a smooth readily combed end structure.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawing, forming a part hereof are illustrated several embodiments of the invention, in which drawing similar reference characters designate corresponding parts, and in which:

FIGURE 1 is a view in side elevation of a person's head showing the manner in which hair is secured to existing hairs.

FIGURE 2 is a somewhat diagrammatic view on an enlarged scale showing the manner in which additional strands of natural or artificial hairs are secured to existing hairs.

FIGURE 3 is a fragmentary view of a portion of a person's head showing the application of artificial or natural hairs to the live hair on a scalp.

FIGURE 4 is a view similar to FIGURE 3 showing a further embodiment of the present invention.

FIGURE 5 is a somewhat fragmentary view greatly enlarged showing the application of a branched artificial hair to an existing live hair on a person's scalp.

FIGURE 6 is a somewhat diagrammatic view showing the manner in which the live hair on a person's scalp

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may be held during the attachment thereto of artificial or supplementary hair strands.

Referring to the drawing, and particularly to FIGURES 1 and 2, 10 indicates the scalp of a person's head on which it is assumed there is growing a certain amount of live hair 11. In accordance with the practice of the present invention it is desired to increase the number of hairs on the scalp 10, by the attachment of artificial or natural hair 12, to the existing live hairs 11.

As shown in FIGURE 2 the attached hair 12 may consist of a single strand of hair or several strands 13. In either event, the hair 12, 13, is secured to the base of the live hair 11 by means of a suitable adhesive. A satisfactory adhesive for this purpose must be capable of withstanding repeated washings and must be strong enough to hold the artificial hair to the live hair during combing operations. Such an adhesive may be selected from any of the well known two-part cold curing systems of urethane based adhesives. These adhesives will not injure the existing hairs and will remain effective through continued periods of washing and combing.

By securing the artificial hairs 12, 13, to the base of the existing hairs 11, it is possible to run a comb through the combined hairs so as to eliminate tangles, knotting, and to provide for a part in the usual manner of hair care. In FIGURE 3 there is shown the application of a group of hairs 13 to a group of existing or live hairs 14. The existing hairs 14 are held in the manner illustrated in FIGURE 6 as by means of a comb 16, so that the base of the hairs 14 is exposed. The hairs to be added to the live hairs 14 are then dipped into an adhesive 15 while held by a suitable tool (not shown). The hairs 13 with the adhesives 15 thereon are then brought to bear against the bases of the natural or live hair 14, as shown in FIGURE 6. As soon as a bond has been effected between the live hair and the supplementary hair 13, the same operation may be repeated at another portion of the scalp.

In order to bring about a rapid thickening of hair it is possible to employ an artificial hair shown in FIGURE 5 and indicated at 17. This hair is branched as shown at 18 so that a plurality of strands extend from a common stem 19. The common stem 19 is secured to the live hair 11 of a person by means of the adhesive 15 in the manner hereinabove set forth. It is sometimes desirable that the stem 19 be tapered at the bottom thereof as indicated at 20 so that a smooth juncture is achieved at this point between the live and artificial hairs.

From the foregoing it will be seen that there has been provided a method of attaching artificial or supplemental hairs to the live hair of a wearer in a permanent natural looking way. The applied hair is permanently attached to the existing hair and may be washed or combed in the same manner as a person's natural hair is treated. The amount of hair thickening which can be achieved is entirely dependent on the number of hairs to be added and the distribution of the hairs will depend upon the judgement of the person applying the said hairs.

In the process of applying the artificial hairs to the living hairs, the living hair is first washed very thoroughly to remove as much of the natural oil therefrom as is possible. This step is important for the purpose of improving the adhesion of the artificial hair to the living hair. Thereafter additional hairs are glued in place as described above.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. The method of permanently securing supplemental hairs to the existing hairs on top of the head, comprising the steps of applying adhesive to one end of a first

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group of parallel, coextensive hairs having opposed free ends, securing the group of hairs to a second group of adjacent, natural hairs on the top of a person's head by attaching the adhesive ends of the first group to the ends of hair in the second group that are in contact with the scalp in a manner so that both groups lie generally parallel with each other, and repeating the above steps in sequence, as desired, for thickening the amount of hair on a person's head.

2. The method of permanently securing supplemental hairs to the existing hairs on top of the head, comprising the steps of washing the existing hairs on top of the head to remove the oil therefrom, applying adhesive to one end of a first group of parallel, coextensive hairs having opposed free ends, securing the group of hairs to a second group of adjacent, natural hairs on the top of a person's head by attaching the adhesive ends of the

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first group to the ends of hair in the second group that are in contact with the scalp in a manner so that both groups lie generally parallel with each other, and repeating the above steps in sequence, as desired, for thickening the amount of hair on a person's head.

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15 RICHARD A. GAUDET, *Primary Examiner*.

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3,521,645

## PROCESS FOR SETTING AND RETAINING STYLE IN WIGS

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Massachusetts

No Drawing. Filed May 17, 1966, Ser. No. 550,630  
Int. Cl. A41g 3/00, 5/00

U.S. Cl. 132-5

5 Claims

### ABSTRACT OF THE DISCLOSURE

The present invention is directed to the use of a pressurized low molecular weight organic activating solvent which is substantially water free for application to a previously styled wig the filaments of which have been coated with a polymeric material. The solvent under pressure is caused to be sprayed upon the styled coated filaments to cause the polymeric material to soften and form bonds at contact points among and between the coated filaments to preserve the imparted style.

The problem existing in the art prior to the present invention may be best stated as follows: when a woman sprays her hair to keep it in place, she mainly stabilizes the hair which is exposed. Thus the bulk of her hair is not stabilized. For this reason, large quantities of spray are sometimes used. Each time she brushes and/or combs her hair, she breaks the hair-to-hair bonds and she must then re-spray her hair in order to have the new styling stay in place. This process leads to spray build-up with dullness, harshness, etc.

The present invention proposes a process whereby the stability of a styled wig may be retained for long periods without mussing or losing its style. The process is generally set out as entailing first the treatment of the wig whether it be a natural hair wig or a wig of synthetic filaments as shown in U.S. Letters Patent No. 3,139,093, patented June 30, 1964. All of the hair is treated with a resin either by immersing the wig in a resin solution or by rubbing a resin into the hair. The carrier for the resin evaporates and the fibers or filaments of the wig which are to be styled are coated with a film of resin. A conditioner consisting of lubricants and antistatic agents and perfumes may be applied to the stylable filaments either in conjunction with the resin or as a separate step.

The stylable filaments of the wig are then styled to impart a so-called hair-do which may be of the "Flip," "Bouffant," "French Twist," "Sea Breeze," or such other hair-do styles as may be pleasing to the owner of the wig. When the wig has been styled, an activating agent is then applied to the thus styled wig and in one form this may be an aerosol spray which is sprayed onto the hair at a fairly close range so that there is more than surface treatment that the activating agent actually enters between interstices defined by the stylable filaments in the hair-do. This activating agent will cause the formation of bridges between fibers or filaments and this activating process is further enhanced by the stylist who continuously sprays small amounts of the activating solvent onto the hair or filaments as it is being styled since this is an aid in styling. The solvent does not completely evaporate during the styling operation and at the completion of styling after the final spraying has been done, the bulk of the hair is also stabilized. The hair is then not disturbed for 10-15 minutes so that the resin coating on the stylable filaments which has been softened by or dissolved in the solvent has an opportunity to form bridges between the stylable filaments. Whether the resin is softened by or dissolved in the solvent will depend on the proportion of

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resin to solvent at any particular site on the stylable side of the wig. It is also important that to effect softening that the selection of a solvent must be a specific solvent for each type of polymeric material.

One of the great advantages of the present process is that the wig can be brushed out, re-styled and re-sprayed repeatedly without any build-up of "lacquer," resin, etc.

The styled wig in accordance with the present process holds its shape, that is, the hair does not get out of place for long periods. In spite of the holding power of the resin coated stylable filaments and the activation and fusion by the addition of a solvent thereto, the filaments thus treated do not appear visually to be sprayed or "stiff."

The hair or stylable filaments when treated in accordance with the present invention is more manageable and styles more easily and permits greater versatility of styling.

By way of a coating to be imparted to the wig, we have found that polyvinyl pyrrolidone (PVP), copolymers of PVP and vinylacetate (PVP/VA), and polyvinylacetate work most effectively with the present invention. Most of the commercial hair sprays are designed to wash out during shampooing. Yet those materials which are water soluble are usually hygroscopic and will often soften under conditions of high relative humidity, and the style will fall out. The resin coating applied in accordance with the present process may by way of example be an emulsion or dispersion of polyvinylacetate in water; PVA is not hygroscopic.

As an activator of the present invention we have found that a low molecular weight substantially water free activating solvent is most effective. We have had good success when working with polyvinylacetate as a polymeric material for coating the stylable filaments when applying a ninety-five (95%) percent ethyl alcohol. The ninety-five (95%) percent ethyl alcohol may be applied in the form of a spray which contains the usual propellants, by way of example, Freon, and a trace of perfume. The perfume is low boiling so that it evaporates fairly quickly from the wig. In this way, there is no perfume build-up.

When working with synthetic wigs, that is, wigs of the type described in the above U.S. Letters Patent, wherein the stylable filaments are of a modocrylic filament known as Dynel, this filament requires an antistatic agent. Therefore, we treat the wig with a solution consisting of a mixture of a glycol lubricant, a non-tacky amine condensate as an antistatic agent, and a perfume. We have found that the two-step process works satisfactorily when using the polyvinylacetate resin. First we apply the resin solution, dry it, then we apply the conditioner solution and dry it. A one step process may be employed when we use a polymeric material compatible with our present conditioner. The key is that the conditioner must be compatible with the resin and numerous modifications of resins and conditioners may be employed with varying degrees of satisfactory utility. If we apply PVA and glycol-amine condensate conditioner to the wig from the same solution, the film flakes off in subsequent brushings because the conditioner and antistatic agent changes the adhesion and film characteristics of the resin. With PVP resins we can use one solution without any detrimental effects but we find that they are not completely permanent in water. The glycol-amine condensate conditioner is water soluble and will be removed when the wig is washed.

As an example of an antistatic agent which resists washing, we employed "Zelec DP" which is a product of the Du Pont Company and which is described in U.S. Letters Patent No. 2,694,688, briefly described as a polymeric alkyl sulfate quaternary ammonium salts of the acryloyloxyethylamine type. We may also employ another class of permanent antistats known as "Astons." These are

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polyamines and are described in U.S. Letters Patents Nos. 3,063,870 and 3,070,552.

The present invention is best realized in practice when a wig to be styled is first coated so that the stylable filaments have a film of polymeric material deposited thereon.

The thus coated wig is then styled to impart the desired hair-do thereto. After the styling step is completed and the operator or the owner of the wig is satisfied therewith, the activator is then applied in the form of application of a low molecular weight substantially water free activating solvent which acts upon the polymeric material on the stylable filaments to soften and form bonds at contact points among and between the coated filaments to preserve the imparted hair-do into which the wig has been styled.

The following are examples of polymeric materials which we have found to be most effective in this method of preserving hair styles set into wigs:

- (1) Polyvinylpyrrolidone
- (2) Polyvinylpyrrolidone and its copolymers, particularly with vinylacetate.
- (3) Polyvinylacetate, its copolymers and its carboxylated derivatives.
- (4) Dewaxed shellac.
- (5) Copolymers of methyl vinyl ether and maleic anhydride and esters of these products.
- (6) Acrylic esters and copolymers.
- (7) Cellulosic derivatives such as ethyl cellulose, cellulose nitrate, and cellulose acetate.
- (8) Polyamide resins.
- (9) Copolymers of vinyl chloride and vinyl acetate.

The following are examples of low molecular weight substantially water free activating solvents which react with the resins of the polymeric materials set forth above in the examples to soften or dissolve the polymeric material to cause fusion or bonding at the contact points between filaments:

- (1) Alcohols such as ethyl-, methyl-, and isopropyl.
- (2) Ketones such as acetone and methylethyl ketone.
- (3) Esters such as ethyl acetate, methyl acetate, isopropyl acetate.
- (4) Chlorinated hydrocarbons such as carbon tetrachloride, methylene chloride, ethylene dichloride, trichloroethylene.
- (5) Hydrocarbons such as benzene.
- (6) Ethers such as propyl ether.

Although a wide variety of solvents can be used, for practical purposes the boiling point of the solvent should be in the range of about 100–200° F. If the boiling point is below 100° F. the solvent will evaporate too rapidly

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to effect good activation and if the boiling point is above 200° F. the wig stays wet for too long a period. For practical purposes the wig should dry in no longer than about 30 minutes.

Solvents that have a higher boiling point could be used if longer periods of drying were practical or if driers using heat and/or fans were available.

Although we have disclosed herein the best forms of the invention known to us at this time, we reserve the right to all such modifications and changes as may come within the scope of the following claims.

What we claim is:

1. The method of styling wigs of human and synthetic stylable filaments comprising

- (a) first treating the stylable filaments with a polymeric resinous material which forms a coating on the filaments,
- (b) styling the thus coated filaments into a desired hair-do, and

(c) thereafter applying to the thus styled coated filaments a pressurized low molecular weight organic activating solvent substantially water free of a concentration range of the order of 90% to 100% and of a boiling point of 100–200° F. to soften the polymeric resinous material to form bonds at contact points among and between the treated filaments to preserve the imparted style.

2. A low molecular weight organic activating solvent as claimed in claim 1 of the group of ethyl, methyl and isopropyl alcohol.

3. A low molecular weight organic activating solvent as claimed in claim 1 of the group of ketones.

4. A low molecular weight organic activating solvent as claimed in claim 1 of the group of chlorinated hydrocarbons.

5. A low molecular weight organic activating solvent as claimed in claim 1 in a container pressurized with a gaseous propellant.

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LOUIS G. MANCENE, Primary Examiner

J. W. MITCHELL, Assistant Examiner

U.S. Cl. X.R.

424–47

[54] **COMB FOR SUBDIVIDING HAIR STRANDS**

[75] **Inventor:** Victor Esposito, Pittsburgh, Pa.

[73] **Assignee:** Frost Enterprises, Inc., Pittsburgh, Pa.

[21] **Appl. No.:** 726,563

[22] **Filed:** Sep. 27, 1976

[51] **Int. Cl.<sup>2</sup>** ..... A45D 24/00

[52] **U.S. Cl.** ..... 132/124; 132/11 R

[58] **Field of Search** ..... 132/11 R, 161, 48 A,  
132/48 R, 137, 9, 124, 127, 144, 111 R

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*Primary Examiner*—Louis G. Mancene

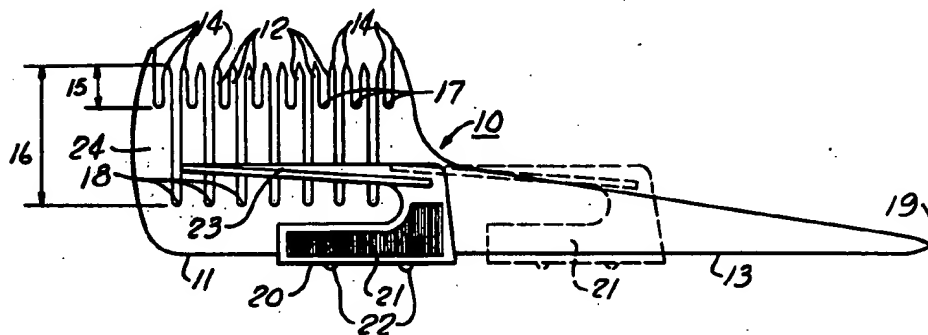
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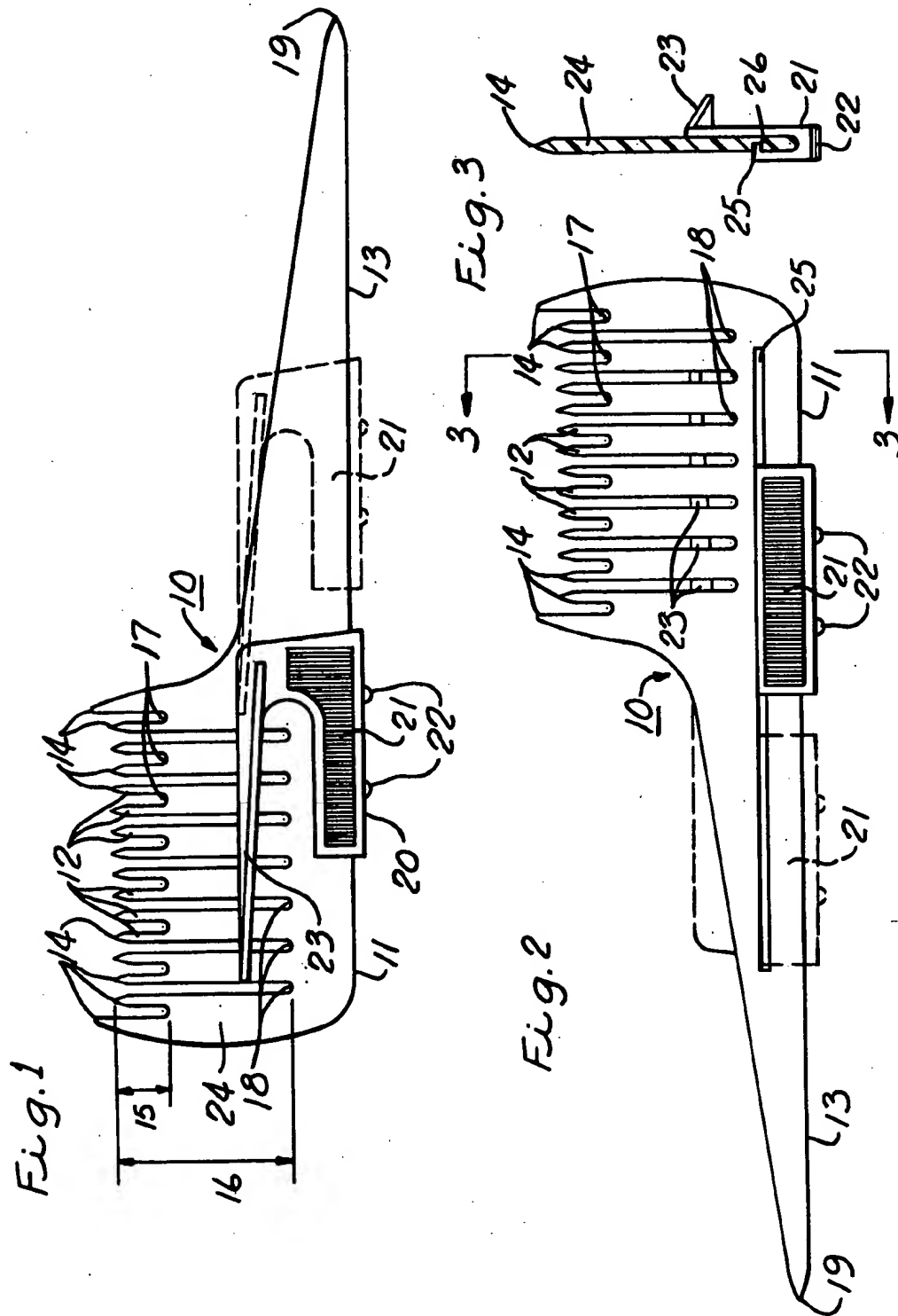
[57]

**ABSTRACT**

A styling comb having teeth of different root depths such that the depth of the root space between adjacent teeth alternately varies between shallow and deep thereby forming a natural separation of the strands of hair as the comb is drawn through hair on a subject's head. A slide slides along a base or handle of the comb such that it may be slid by thumb contact of the same hand in which the operator grasps the comb. A finger is secured to the slide and designed such that it extends longitudinally along a side face of the comb between the shallow and deep root spaces between comb teeth such that the finger will segregate hair strands lying in the deep root spaces of the comb when the slide member is slid into position.

**2 Claims, 3 Drawing Figures**





## COMB FOR SUBDIVIDING HAIR STRANDS

### BACKGROUND OF THE INVENTION

#### 1. Field of Invention

This invention relates generally to combs and more particularly to combs for uniformly separating or subdividing hair strands in order to treat only selected strands of hair.

#### 2. Discussion of the Prior Art

In treating human hair for coloring effects, it is desirable in many instances to dye or treat a uniform dispersion of the hair strands or tufts throughout the entire body of hair. This technique is generally employed, for example, for a hair coloring process known as frosting.

One apparatus utilized to uniformly subdivide strands or tufts of hair is a comb which has adjacent teeth of different root depths thereby uniformly subdividing the hair strands or tufts in the deep and shallow root portions of the comb. This type of apparatus and process is illustrated in U.S. Pat. No. 3,952,755 which issued to Karol C. Fisher on Apr. 27, 1976.

When the comb of this structure is drawn through the subject's hair such that the hair strands or tufts are uniformly subdivided into the comb teeth deep root and shallow root spaces, a wire is slid into a recess which extends longitudinally along a side face of the comb between the shallow and deep roots to complete the subdivision.

This comb of prior art is effective, but nevertheless, has shortcomings in that it takes two hands to operate the comb i.e., one hand to hold the comb and the other hand to manipulate the slide wire, and if the slide wire is not sufficiently straight, it can be readily seen that the end of the slide wire will not properly align with and mate the recess in which it is received when the end of the wire advances through this segmented recess from one tooth to the next.

It is the principal object of the present invention to eliminate these disadvantages of the comb structure disclosed in U.S. Pat. No. 3,952,755.

### SUMMARY OF THE INVENTION

The comb for separating or subdividing hair strands of the present invention comprises an elongated comb root base having a series of parallel comb teeth extending off one edge of the base and the depth of the root space between adjacent teeth as measured from the top of the teeth alternately varies between shallow and deep. A slide member is slidably secured to the root base such that it will slide longitudinally therealong. A finger attached to this slide member, longitudinally extends along one side face of the comb between the shallow and deep root spaces to segregate the hair strands lying in the deep root spaces upon manipulation of the slide member by the comb operator.

In this manner, the difficulty of attempting to slide a wire through a segmented recess from one tooth to another is eliminated, and in addition, one operating the comb of the present invention can operate the slide member at the same time and with the same hand in which he is grasping the comb. In addition, the slide member is preferably exposed on opposite sides of the root base of the comb so that the slide member may be operated by one who is left handed as well as one who is right handed.

### BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages appear in the following description and claims.

The accompanying drawings show, for the purpose of exemplification without limiting the invention or the claims thereto, certain practical embodiments illustrating the principles of this invention wherein:

FIG. 1 is a view in side elevation of the comb of the present invention.

FIG. 2 is a view in side elevation showing the back side of the comb in FIG. 1.

FIG. 3 is an end view of the comb shown in FIG. 1 as seen from the right-hand end thereof.

### DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings, the comb 10 of the present invention consists first of all of the basic comb elements, namely, the comb root base 11, the series of parallel comb teeth 12 which extend off one edge of the comb root base 11 and handle 13 (which basically an extension of comb root base 11). The root spaces between adjacent teeth 12 vary in depth as measured from the tops 14 alternately from a shallow depth 15 to a deep depth 16. The shallow root spaces between adjacent teeth 12 are designated 17, and the deep root spaces between adjacent teeth are designated 18.

Handle 13 is designed such that it is long and narrow and terminates at a point 19. This serves two purposes. First of all, the elongated narrow handle 13 serves as a typical "rat tail" comb wherein the handle of the comb itself is easily utilized as a working tool to pick up or select strands or tufts of hair as any rat tail comb might be normally utilized. In addition, the construction of handle 13 provides a handle which is sufficiently long such that the hairdresser may grip the outer end of the handle 13 and still have sufficient handle length remaining to operate slide member 20 longitudinally back and forth along comb root base 11 with same hand that grasps the comb, as will be explained in greater detail hereinafter.

Slide member 20 is an independent piece which is slidably secured to root base 11 so that it will slide longitudinally therealong by finger engagement (usually the thumb). Slide member 20 is maintained in this sliding relationship with root base 11 by reason of protrusion 26 of the slide member which is received in slide groove 25 in the side of base 11.

In the Figure, slide member 20 is indicated in its full forward position, and the dashed outline thereof indicates the position of slide member 20 in its retracted position.

Slide member 20 has a U-shaped configuration (as best illustrated in FIG. 3), which accordingly exposes portions of the slide member on opposite sides of the root base 11. This permits finger engagement of slide member 20 on either side of the comb 10 so that it may be readily utilized by either left-handed or right-handed persons. FIG. 1 illustrates the comb in the position that it would be grasped by the right-handed person, and FIG. 2 illustrates the back side of the same comb as it would be seen and grasped by a left-handed person. Both sides of the slide member 20 are provided with roughened surface areas 21 to prevent slippage when engaged by one's thumb or finger in order to slide member 20 longitudinally back and forth along the comb



root base 11. The bottom of slide member 20 is also provided with projections 22 for the same reason.

Finger 23 extends from slide member 20 and further extends longitudinally along one side face 24 of the comb 10 between the shallow root spaces 17 and the deep root spaces 18. In this regard, it should be observed that when slide member 20 is in its retracted position as indicated by the dashed lead line and outline thereof, the deep root tooth spaces 18 are totally open, as any normal comb would be, to permit strands of hair being combed to fall all the way through the deep root tooth spacings to the bottom thereof as indicated at 18. When slide member 20 is slid to the forward position as shown in the figures, finger 23 slides across side face 24 of the comb to isolate or segregate any hair strands which are lying in the deep root spaces 18.

The comb is utilized by the hair stylist or beautician by making upward strokes through the hair so that the comb is held in the position as indicated in the drawings. With the same hand with which the beautician grasps the handle 13, he slides slide member 20 longitudinally to the retracted position as indicated by the dashed outline, usually making use of his thumb.

He then makes an upward stroke through the subject's hair. Due to the tooth configuration as previously explained, the combination of shallow and deep root teeth creates a natural subdivision or segregation of hair strands or tufts in a uniform manner such that a number of hair strands lie on shallow tooth root spaces 17 and a generally proportionate number of hair strands lie on deep root spaces 18. At this point, the beautician then slides slide member 20 forward to its closed position as indicated in the figures, thereby completing the subdivision or separation operation such that the hair strands lying in deep root spaces 18 are completely segregated.

In this regard, it should be noted that finger 23 is wedge shaped and thickens towards its rearward extent. This causes the finger 23 to have a wedging action on the hair strands confined within deep root spaces 18 so that once slide member 20 is placed in its forward position as indicated, finger 23 tends to clamp down on the hair strands trapped therein. The result is that the beautician at this point in time may release the comb entirely and the wedging action of finger member 23 against the hair strands will hold the comb in place on the subject's head in and of itself.

The beautician then has both hands free to pick up and work with those hair strands or tufts which lie in the shallow root spaces 17 to work with them as required. For example, the beautician will normally utilize other equipment to bleach or frost or otherwise color these selected strands of hair lying in the shallow root spaces 17. The comb is simply convenient tool to uniformly subdivide the hair strands so that only a uniform dispersion of the hair strands may be readily treated.

For a more detailed description of the hair treating techniques which might thereafter follow, one should refer to U.S. Pat. No. 3,952,755 or U.S. Pat. No. 3,800,811.

I claim:

1. A comb for subdividing hair strands comprising an elongated comb root base having a series of parallel comb teeth extending off one edge thereof with the depth of the root space between adjacent teeth from the teeth tops alternately varying between shallow and deep, a slide member slidably secured to said root base to slide longitudinally therealong, a finger extending from said slide member and longitudinally along a side face of the comb between said shallow and deep root spaces to segregate hair strands lying in said deep root spaces at will by sliding said slide member along said root base.

2. The comb of claim 1 including a comb handle extending from one end to said root base, said slide member having portions thereof exposed on opposite sides of said root base for slide contact on either side of the comb.

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# United States Patent [19]

Lee

[11] Patent Number: 5,018,542

[45] Date of Patent: May 28, 1991

## [54] INSTRUMENT FOR SELECTIVITY SEPARATING STRANDS OF HAIR

[76] Inventor: Peter M. Lee, 11219 84th South,  
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[21] Appl. No.: 514,861

[22] Filed: Apr. 26, 1990

[51] Int. Cl.<sup>5</sup> ..... A45D 24/04

[52] U.S. Cl. .... 132/139; 132/150;  
132/161; 132/901

[58] Field of Search ..... 132/126, 137, 138, 139,  
132/150, 161, 901, 208, 160

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Primary Examiner—John J. Wilson

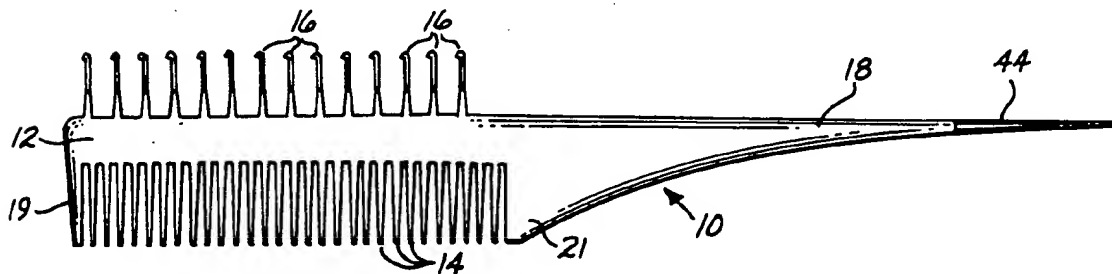
Assistant Examiner—Frank A. LaViola

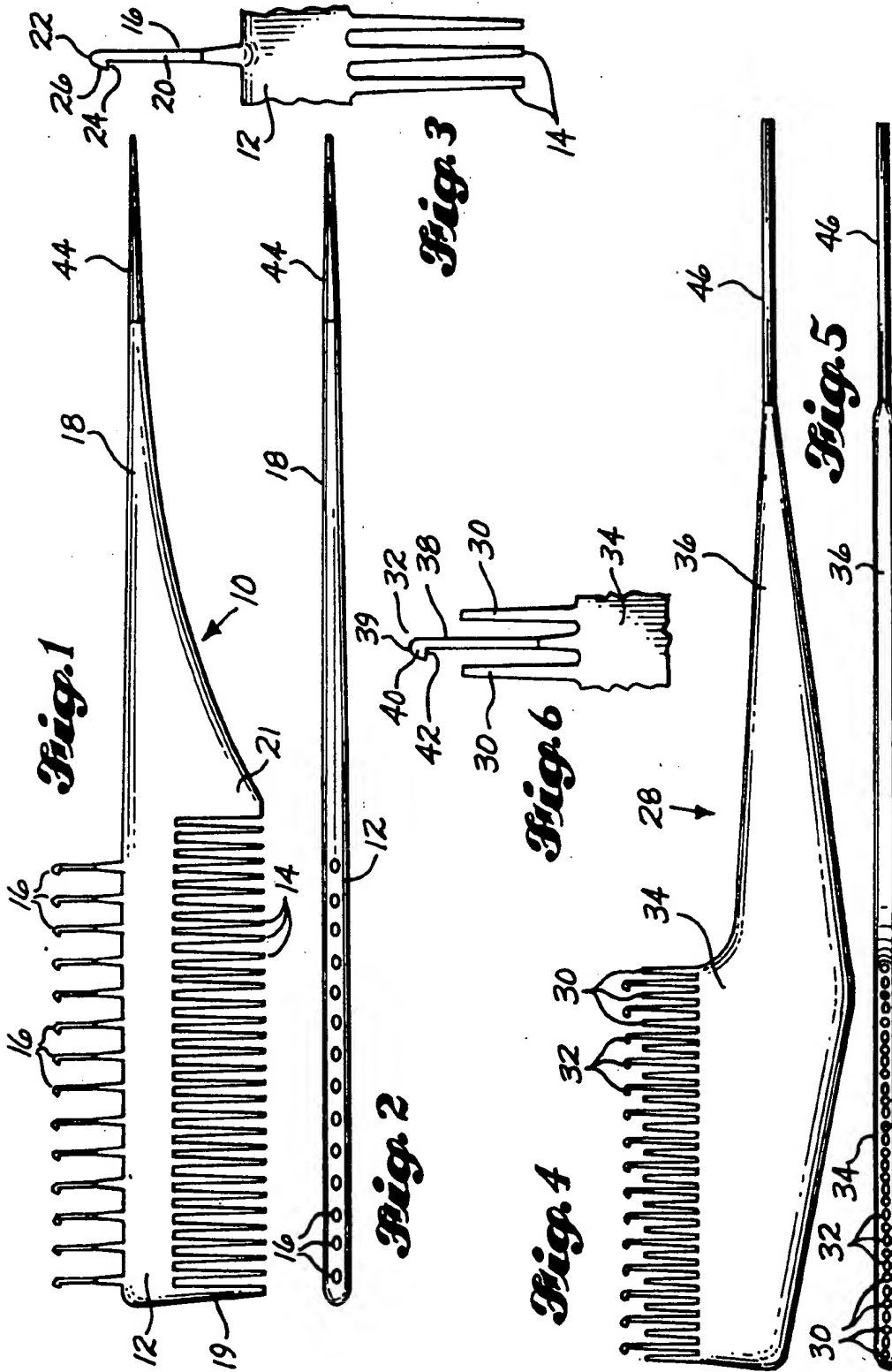
Attorney, Agent, or Firm—Glenn D. Bellamy

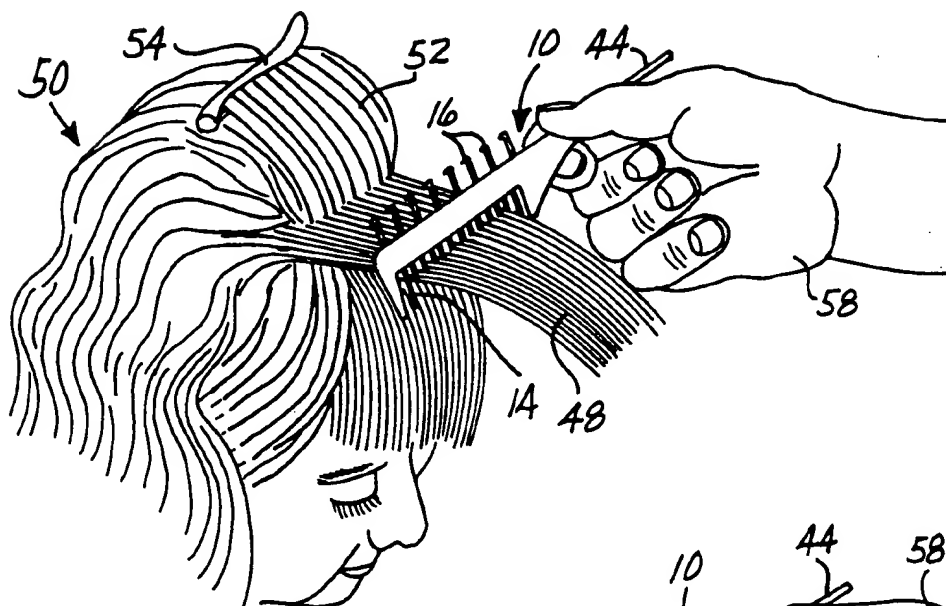
### [57] ABSTRACT

A comb for selectively separating strands of hair for individual treatment includes an elongated base and a plurality of teeth positioned at spaced-apart locations along the length of the base. Each tooth includes a shaft which extends outwardly from the base to a free end. The teeth include a hair-engaging portion at the free end of a shaft which is substantially linearly straight and smooth from the base to the hair-engaging portion. The hair-engaging portion is positioned to engage only selected strands of hair while allowing non-selected strands to fall freely from between the teeth as the comb is lifted, moving the teeth in a direction toward the base through the lock of hair. Each hair-engaging portion includes a tine member which extends outwardly from the shaft to define a substantially open hook throat. Each tine member is on a common side of each tooth so that the selected strands may be released from each hook throat by a single longitudinal movement of the base. The teeth having a hair-engaging portion may be positioned separately on the base from other teeth which may not have a hair-engaging portion, or both types of teeth may be positioned in an alternating arrangement together on a single side of the base.

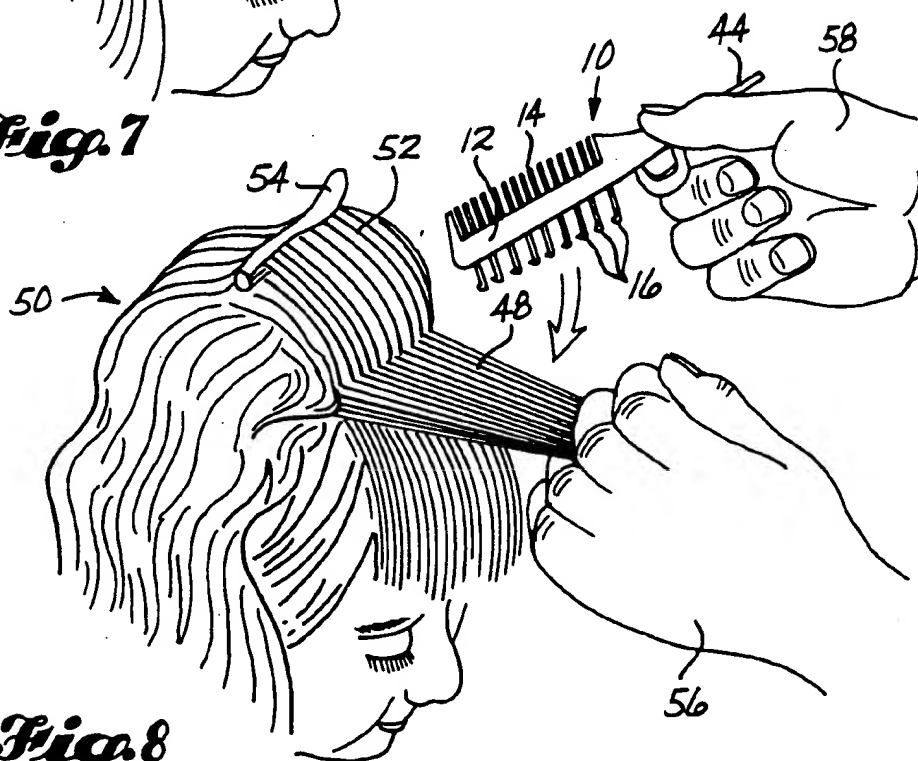
5 Claims, 4 Drawing Sheets



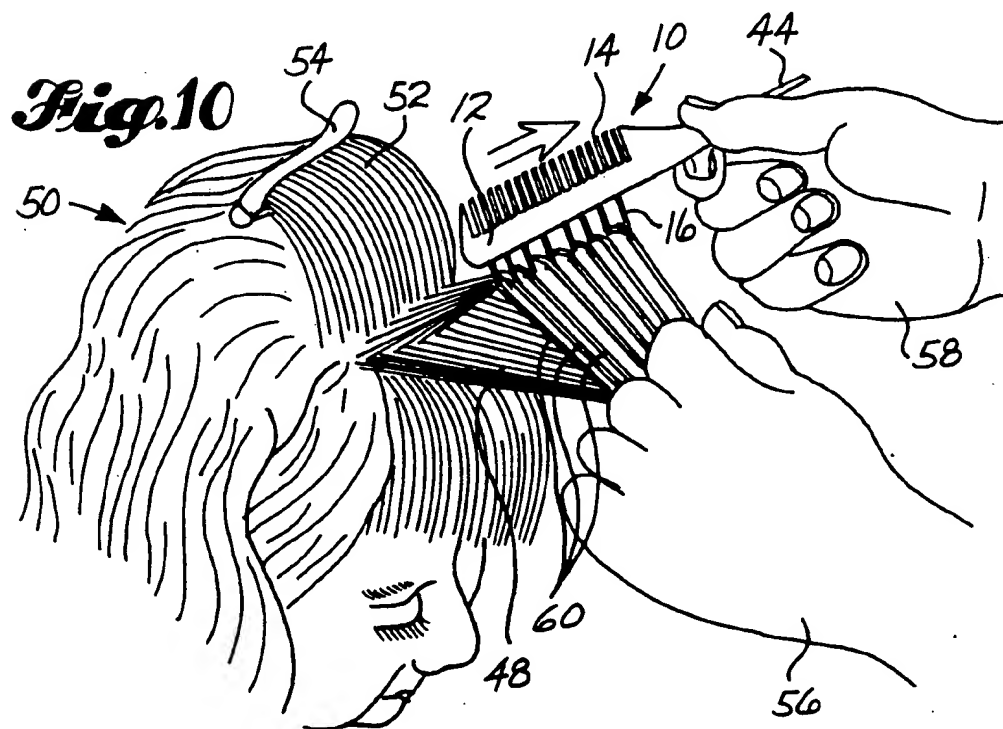
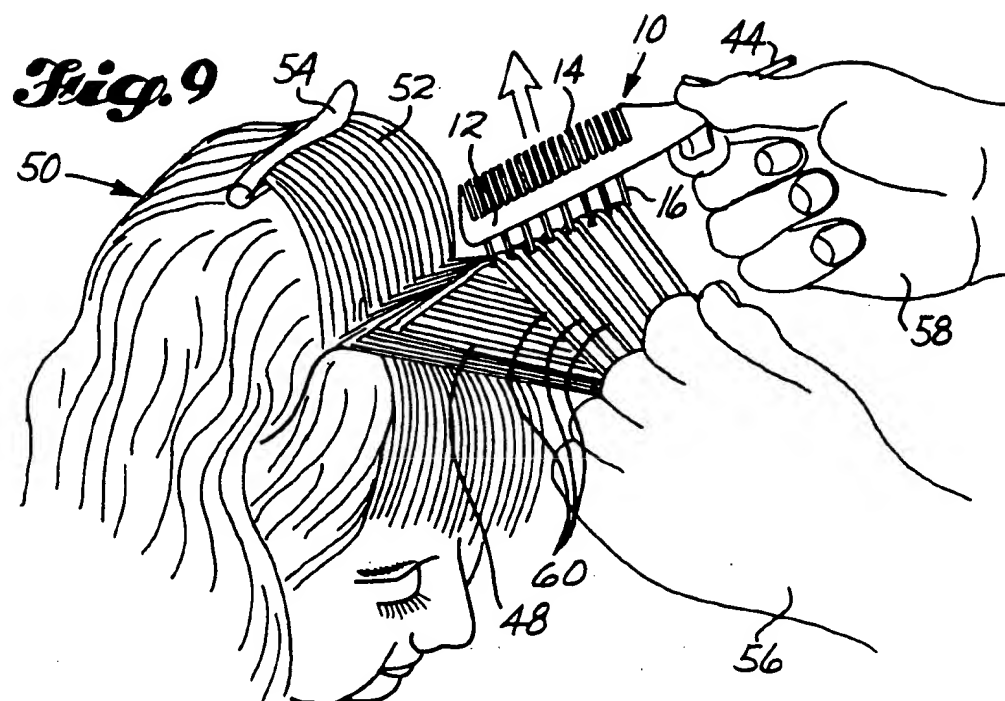


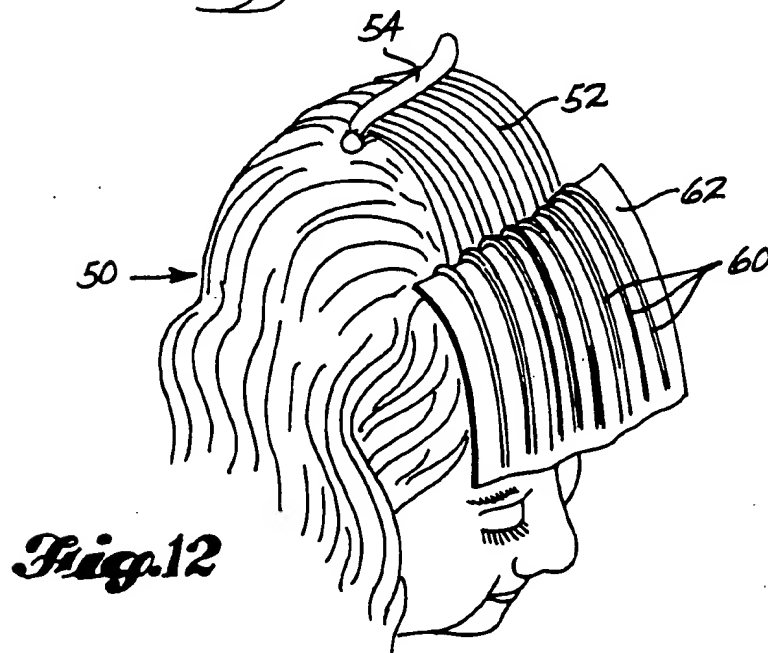
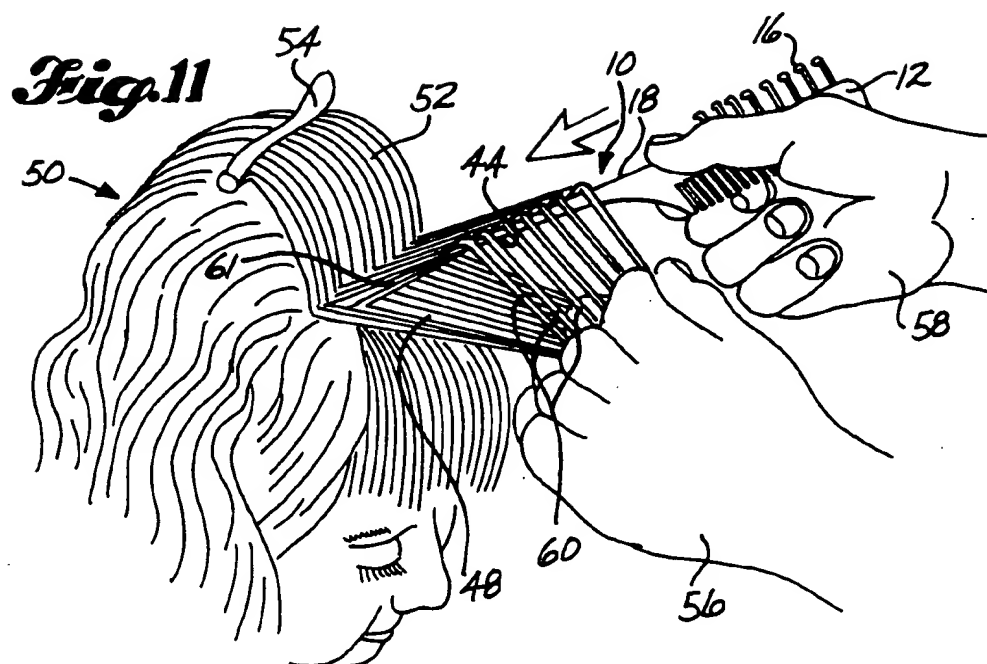


**Fig. 7**



**Fig. 8**





# INSTRUMENT FOR SELECTIVITY SEPARATING STRANDS OF HAIR

## DESCRIPTION

### 1. Technical Field

This invention relates to a comb having hair-engaging teeth for selectively separating strands of hair for the purpose of color treating or highlighting the selected strands of hair.

### 2. Background Art

A hair treatment which is presently popular and which has been for many years is that of color highlighting or "frosting" by selectively color treating separate strands of hair. Generally, this is accomplished by applying a color treatment solution to only those strands selected to be treated while protecting the remaining hair from treatment.

Separation and selective treatment of hair strands has previously been accomplished by first placing a perforated cap over the head of the person whose hair is to be treated and then pulling strands of hair through perforations in the cap using a hook instrument. The hairs pulled through the cap could then be treated with a solution while the remaining hair and scalp was protected from the solution by the cap. Devices for carrying out treatment according to this general method are shown in U.S. Pat. Nos. 3,468,318; 3,477,446; and 4,760,855.

U.S. Pat. No. 3,552,403 shows a device which is suitable for selectively separating relatively short strands of hair. That device is in the form of an elongated comb which includes a series of coplanar hooks arranged to extend outwardly from the back of the comb. The hooks are used to select strands from a lock of hair by lifting the hooks upwardly through the lock. Because of the shape and arrangement of the hooks, the instrument must be pulled through the entire length of the selected strands of hair to release the selected strands from the hooks.

U.S. Pat. No. 3,835,870 shows a device in the form of a comb having wide teeth with foot portions which, when pulled through hair, hold some strands against the scalp and allow alternate strands to pass between the teeth. These strands are then manually lifted with another instrument and separated for selective treatment.

A presently more common method of separating strands of hair for special treatment is to first comb out a thin lock or hank of hair, then to weave a thin rod with a hook end or "crochet hook" type instrument through the lock of hair, and then to retract the instrument in a manner which pulls out the selected strands of hair.

Each of the above-described methods or instruments are time consuming and require substantial training and practice to be used successfully and proficiently, or require that a separating device be pulled through the entire length of the hair strands, a step which is unacceptably difficult with relatively long hair.

## SUMMARY OF THE INVENTION

The present invention provides an instrument similar in concept to that shown in U.S. Pat. No. 3,552,403, except that it includes many greatly improved features and aspects not previously found in the prior art. The present instrument is in the form of a comb which may be used to quickly and easily separate selected strands of hair for individual treatment. The comb includes an

elongated base with a plurality of teeth extending outwardly from the base to a free end. The teeth are positioned along the length of the base and include a hair-engaging hook portion at each free end. The hook portion includes a tine which extends from the tooth substantially toward a single longitudinal direction of the base to present a relatively open hook throat.

In use, a relatively flat lock or hank of hair is combed from the head and held in one hand in a position which could otherwise be used for the tedious weaving with a "crochet hook" type instrument. Instead, however, the teeth of the present invention are simply pulled through the lock of hair to a midpoint and then lifted through the lock of hair, each hair-engaging hooked end lifting with it a selected strand of hair. The selected strands may be released from the hook ends by simply a slight longitudinal movement of the base of the comb a sufficient distance to release the strands of hair from the hook ends and to draw the teeth upwardly there-through, free of the hair with the hairdresser's finger or the "rat tail" portion of the comb handle.

The selected strands are then easily separated from the remainder of the lock of hair. In this manner, relatively long hair may be selectively separated without the need for pulling the instrument through the entire length of the hair. This is an important aspect of the invention as the random selection of strands from a lock of hair causes crossover and tangling of individual hairs. In order to create natural-looking hair coloration or highlighting, the strands of hair must be separately treated along their entire length from root to end. Entanglements at the base of the hairs can cause either the selected strands not to be treated thoroughly at their base or allow bleed-over of the treatment onto non-selected hairs near their roots. In relatively long hair, there will be entanglements outwardly from where the strands were separated regardless of how well the lock of hair was combed or brushed prior to separation. These tangles should be separated gently by the hairdresser by using either a finger or "rat tail" comb handle. If instead, however, the hooks of the selecting instrument are pulled through the entire length of the hair, it is likely that many hairs will be unnecessarily and painfully broken or detached from the subject's head.

Another feature of the invention is that the instrument may be provided with straight comb teeth and hooked comb teeth arranged in an alternating pattern and with the hair-engaging hook portions of the hook teeth positioned outwardly beyond the free ends of the straight comb teeth. This arrangement allows a hairdresser to use the instrument for both a tradition comb and a hair-selecting instrument with the other features of the present invention without the need for reversing or exchanging the instrument.

The instrument of the present invention may be used rapidly and successfully by experienced and novice hairdressers alike. Other aspects and features of the present invention will become apparent from a reading of the following detailed description of a preferred embodiment, the following claims, and inspection of the various figures of the drawing, all of which are a part of the present disclosure.

## BRIEF DESCRIPTION OF THE DRAWINGS

Like reference numerals are used to indicate like parts throughout the various figures of the drawing, wherein:

FIG. 1 is a side view of a first preferred embodiment of a weaving comb according to the present invention;

FIG. 2 is an edge view of the comb shown in FIG. 1;

FIG. 3 is a fragmentary detailed view of a section of the teeth of the embodiment shown in FIG. 1;

FIG. 4 is a side view of a second preferred embodiment of a weaving comb according to the present invention;

FIG. 5 is an edge view of the comb shown in FIG. 4;

FIG. 6 is a fragmentary detailed view of the teeth of the comb shown in FIG. 4; and

FIGS. 7-12 are sequential pictorial views showing one embodiment of the present invention in use.

### BEST MODE FOR CARRYING OUT THE INVENTION

Referring first to FIG. 1, therein is shown at 10 a preferred embodiment of the present invention of an instrument for selectively separating strands of hair. The device 10 is in the nature of a comb having oppositely-directed sets of teeth extending outwardly from a spine or base portion 12. Referring now also to FIGS. 2 and 3, the first set of teeth includes a plurality of longitudinally-aligned tooth members 14 which are in the nature of an ordinary and typical comb. These teeth 14 are relatively straight, thin members which extend outwardly from the base 12 substantially parallel to one another with a predetermined and regular spacing therebetween. Extending longitudinally from the base portion 12 is a handle portion 18 which provides a hand-gripping area for the instrument 10 which is free of teeth. The teeth 14 are preferably made from a material which allows them to be somewhat flexible and resilient. If desired, at each end of the row of teeth 14, may be a heavier, relatively rigid portion 19, 21 extending outwardly from the base 12 as is commonly done with typical combs.

Extending outwardly from the base 12 in a direction opposite from the comb teeth 14 are a plurality of hair-engaging hook-teeth members 16. The hook-teeth members 16 extend outwardly from the base portion 12 substantially parallel to one another and in the same plane, and are aligned along the length of the base 12 substantially opposite the comb teeth members 14.

Referring now specifically to FIG. 3, therein is shown an enlarged detail view of a section of the instrument 10. Each hook-tooth 16 includes a shaft portion 20 which extends outwardly from the base portion 12 to a free end. At the free end is a hair-engaging hook portion 22 including a radially-extending tine 26 which defines a hook throat 24. As will be further described later, the width of the hook throat 24 determines the amount of hair which will be caught and lifted by each hook tooth 16. As used herein, the term "strand" is intended to mean a plurality of individual hairs. The number of individual hairs in a strand will vary, but are relatively few compared to a "lock" or "hank" of hair. The total number of hook teeth 16 and spacing between them determines the total number of strands selected.

The tine 26 extends radially from the shaft 20 on the side of the shaft toward the longitudinal extension of the base 12. As shown in FIG. 1, the tine 26 on each tooth 16 extends in the same longitudinal direction, e.g., the longitudinal direction opposite to the handle 18. The shaft 20 is substantially linearly straight and smooth from the base 12 to the hook portion 22. In this manner, strands of hair will be engaged only with the hook portion 22 and will otherwise be allowed to move freely

over the shaft portion 20 and to fall freely from between the teeth 16, except for the selected strands which are engaged by the throat 24 of the hook portion 22.

Referring now to FIGS. 4, 5 and 6, therein is shown an alternate preferred embodiment 28 of an instrument according to the present invention. In this embodiment 28, a plurality of standard comb teeth 30 and a plurality of hooked teeth 32 are alternately positioned in a single row extending outwardly from a spine or base portion 34. Longitudinally extending from the base 34 is a handle portion 36 which is free of teeth 30, 32.

Referring now in particular to FIG. 6, each hook tooth 32 includes a shaft portion 38 which extends outwardly from the base 34 to a free end. At the free end is a hair-engaging hook portion 39, including a hook tine 40 which extends radially outwardly from the shaft 38 and defines a hook throat 42. Each hook tine 40 extends toward the longitudinal extension of the base 34 and substantially perpendicular to the shaft 38. As shown in FIG. 4, each hook tine extends toward the same longitudinal direction, e.g., opposite to the handle 36. As previously described, the shaft portion 38 is substantially linearly straight and smooth from the base 34 to the hook portion 39. The standard comb teeth 30 are substantially linearly straight and smooth along their entire length.

In preferred form, the hair-engaging hook portion 39 of each hook tooth 32 is positioned outwardly beyond the free end of the straight comb teeth 30. This position is considered to be desirable in that it allows all of the comb teeth 30, 32 to be used together in the nature of a typical comb when the teeth 30, 32 are fully engaged through the hair along the full depth of the teeth 30, 32. The outward positioning of the hair-engaging hook portions 39 allows the instrument 28 to be used as a strand-selecting device without the need for changing instruments or even repositioning the instrument in the hairdresser's hand. This arrangement also allows the selected strands of hair to be more readily released from the hook throat 42 by a longitudinal movement of the base 34. As will be discussed below with respect to the use of the instrument 28, this positioning is important to efficient performance of the instrument 28, although it would be functional, in a limited way, even if the comb teeth 30 were extended to or beyond the length of the hook teeth 32.

At the free end of the handle portion 18, 36 of either embodiment 10, 28, may be a "rat tail" or skewer portion 44, 46 comprising a relatively thin but rigid extension of the handle portion 18, 36. The skewer portion 44, 46 may be tapered to a point or extend with a relatively uniform cross-section to a blunted end. Alternatively, the end may include a hook tine (not shown.) The use of this feature will be described in detail later.

Either of the illustrated embodiments 10, 28 may be formed, as by molding, from a unitary piece of thermoplastic material such as nylon, polyethylene, hard rubber, or any other suitable synthetic material. The device 10, 28 may also be formed entirely of metal or a combination of metal and plastic materials. In preferred form, the base 12, 34, handle 18, 36, and comb teeth 14, 30 are formed of a synthetic plastic material having sufficient rigidity and strength to maintain its shape while being pulled through hair, but having sufficient resiliency to allow minor bending without breakage. The hook teeth 16, 32 and skewer portion 44, 46 may be formed of a metal material with such parts being encapsulated into the base 12, 34 and handle 18, 36 portions as they are



being formed or by insertion of such parts into pre-formed sockets in the base 12, 34 and handle 18, 36 portions. The particular material from which the device 10, 28 is formed or manner in which it is manufactured is not critical to the function and performance of the present invention.

The instrument of the present invention 10, 28 may be used to selectively separate strands of hair to which a hair-treating agent is to be applied or which may be separately cut treating agent is to be applied or which may be separately cut for adding texture or thinning bulk from the hair. The hair-treating agent may be in the nature of a colorant, curling or straightening formula, or any other treatment which is applied to only selected strands of hair.

Use of either of the illustrated embodiments 10, 28 is carried out in essentially the same way. Use of the first embodiment 10 is illustrated in FIGS. 7-12. In use, a hank or lock 48 of the subject's hair 50 is prepared by combing the lock of hair 48 with the common comb teeth 14 of the instrument 10 in order to remove any tangles and to arrange the strands of hair in substantially parallel order. This is shown in FIG. 7. Other portions 52 of the subject's hair 50 may be held out of the way with a typical hair pin or clip 54. Referring to FIG. 8, the combed lock of hair 48 is held by the hairdresser between the fingers of one hand 56 while the other hand 58 moves the hook teeth 16 of the instrument 10 downwardly through the lock of hair 48. The instrument 10 may be moved from its orientation shown in FIG. 7 to that shown in FIG. 8 simply by rotation of the device 10 along its longitudinal axis. In this manner, it is not necessary for the hairdresser to change instruments between steps or to use more than one instrument at the same time.

The hook teeth 16 of the instrument 12 are moved through the lock of hair 48 to a position midway along its length between the hairdresser's hand 56 and the subject's scalp. The instrument 10 is then lifted, as shown in FIG. 9. As it is lifted, each of the hook teeth 16 carries with it selected strands of hair 60. The grip of the hairdresser's first hand 56 is loosened sufficiently to allow the selected strands 60 to longitudinally slide out from between the fingers. The unselected strands of hair fall freely from between the hook teeth 16 and remain in their original position 48.

The amount of hair which is selected in each strand 60 is determined by the width of the hook throat 24, 42 or length of the tine 26, 40 of the hook portion 22, 39 of each hook tooth 16, 32. The volume of hair in the selected strands 60 relative to the hair in the unselected lock 48 is dependent upon both the above-described hook portion size and total number or spacing of the hook teeth 16, 32. If a greater volume of hair is to be selected, an increased number of hook teeth 16, 32 are used and they are more closely spaced along the base 12, 34. The series or row of hook teeth 16, 32 may be evenly spaced along the length of the base 12 or unevenly spaced if a more random selection or finished look is desired. Also, if thinner selected strands 60 are desired, the above-described process may be repeated using the plurality of initially-selected strands 60 as the lock of hair from which a minority of strands are again selected.

Once the strands 60 have been selected and lifted as shown in FIG. 9, the hook teeth 16 of the instrument 10 may be released from the strands 60 simply by first lessening the upward tension which the hook portions

22, 39 place on the strands 60, then moving the instrument 10 longitudinally toward its handle portion 18 or skewer portion 44. This movement is shown in FIG. 10. Because the tine portion 26, 40 of each hair-engaging hook portion 22, 32 extends substantially perpendicular to or only slightly angled from perpendicular relative to the length of the shaft portion 20, 38, the hook throat 24, 42 is relatively open and allows the selected strands 60 to easily be released therefrom when the base 12 is longitudinally moved. The hook teeth 16 may then be lifted from between the selected strands 60. If the tine portion 26, 40 projects from the shaft portion 20, 38 at a sharp angle toward the base 12, 34, or it extends a significant distance back toward the base 12, this simple method of releasing the selected strands 60 will be difficult, if not impossible, to accomplish and it will be necessary to release the hook teeth 16, 32 by pulling them through the length of the selected strands 60. In any event, for the hair-engaging hook portions 22, 39 to release all of the selected strands 60 with a single longitudinal movement of the instrument 10, it is necessary that each hook tine 26, 40 be oriented in a common direction or on a common side of the shaft 20, 38, preferably in the direction of the longitudinal extension of the base 12, 34 opposite the handle 18, 36.

Referring to FIG. 11, after the hooked teeth 16, 32 have been released, the skewer portion 44, 46 or rat tail handle 18, 36, is inserted between the selected strands 60 and remaining lock of hair 48. Because the selected strands 60 are pulled from various depths within the lock of hair 48, there will typically be at least some hairs 61 which remain entangled near the roots of the selected strands 60 and lock of hair 48 or which otherwise bridge between the selected strands 60 and remaining lock 48. With the hairdresser's finger or the rat tail handle 18, 44 of the instrument 10 inserted under the selected strands 60, the strands 60 may be gently and easily separated along their entire length without causing unnecessary and painful breaking or pulling of hairs which would occur if the hooked teeth 16, 32 were forced through the entire length of the selected strands 60. Of course, this is less of a problem when working with relatively short hair.

The selected strands 60 are then grasped by one of the hair dresser's hands 56 while the remaining lock of hair 48 is allowed to fall free or is held out of the way with a clip or hairpin. Referring to FIG. 12, a piece of flexible material 62, preferably a conventional foil wrapper or the like, is slid beneath the selected strands of hair 60 to shield the remaining hair 50 as treatment is applied to the selected strands 60 in a typical and well-known manner. The treated strands of hair are then folded into the wrapper 62 and put aside while other portions of the subject's hair 50 are selected and treated.

The embodiment shown in FIGS. 4-6 is utilized in a manner identical to that described above.

The illustrated embodiments described and their method of use are for the purpose of example only. Many variations to the form or arrangement of elements in the devices 10, 28 may be made without departing from the spirit and scope of the invention. Therefore my patent protection is not to be limited by the illustrated embodiments or description of a method of use, but rather by the following claim or claims interpreted according to accepted doctrines of claim interpretation, including the doctrines of equivalents.

What I claimed is:

1. A comb for selectively separating strands of hair for individual treatment, said comb comprising:

a base having a length;

a plurality of teeth positioned at pre-selected spaced-apart locations along the length of said base, each tooth including a shaft which extends outwardly from said base to a free end and a hair-engaging hook portion at said free end, said hair-engaging hook portion including a tine member which extends outwardly from said shaft, each said tine member being positioned on a common side of each of said teeth substantially toward a direction of the base's length [longitudinal extension], said shaft being substantially linearly straight and smooth from said base to said hair-engaging hook portion, and a hook throat being defined by said tine member between said tine member and said shaft such that said hook throat is substantially open and substantially perpendicular to said shaft; said hair-engaging hook portion being positioned to engage only selected strands of hair while allowing non-selected strands to fall freely from between said teeth as the comb is lifted, moving said teeth in a direction toward said base through a lock of hair, and such that [longitudinal] movement of said base substantially only in a direction of said base's length opposite the position of said

tine members will substantially release said selected strands of hair from said hair-engaging hook portion of each tooth.

2. A comb according to claim 1, further comprising a plurality of secondary teeth, each said secondary tooth being positioned between teeth which include a hair-engaging hook portion at the free end, each said secondary tooth including a shaft which extends outwardly from said base to a free end and being said free end such that the spacing between adjacent tooth shafts is effectively reduced without reducing the preselected spacing between said hair-engaging hook portions.

3. A comb according to claim 2, wherein the hair-engaging hook portion of each of said plurality of teeth is positioned outwardly from said base beyond the free end of each said secondary tooth.

4. A comb according to claim 1, wherein said base includes a handle portion which is free of teeth and which extends longitudinally outwardly therefrom to a free end, said handle portion including a thin skewer portion at said free end.

5. A comb according to claim 2, wherein said base includes a handle portion which is free of teeth and which extends longitudinally outwardly therefrom to a free end, said handle portion including a thin skewer portion at said free end.

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UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

Page 1 of 2

PATENT NO. : 5,018,542  
DATED : May 28, 1991  
INVENTOR(S) : Peter M. Lee

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

ON TITLE PAGE and in,

Col. 1, lines 1-5 the title of the patent, "SELECTIVITY" should be -- SELECTIVELY --.

On the cover page, under "U.S. PATENT DOCUMENTS",  
"2,380,230 by Demyanovich" should be -- 2,380,730 --.

Col. 3, line 20, "device !0" should be -- device 10 -- and in line 22, "portion !2" should be -- portion 12 --.

Col. 4, line 53, delete the numeral "15".

Col. 4, line 65, there is a period after "breakage".

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

Page 2 of 2

PATENT NO. : 5,018,542  
DATED : May 28, 1991  
INVENTOR(S) : Peter M. Lee

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

- Col. 5, lines 10 and 11, delete " treating agent is to be applied or which may be separately cut".
- Col. 5, line 37, "look" should be -- lock --.
- Col. 6, line 68, "What I" should be -- What is --.
- Claim 1, col. 7, line 13, delete "[longitudinal extension]".
- Claim 1, col. 7, line 25, delete "[longitudinal]".
- Claim 2, col. 8, line 9, after "being", insert -- substantially linearly straight and smooth from said base to --.

Signed and Sealed this  
Tenth Day of November, 1992

Attest:

DOUGLAS B. COMER

Attesting Officer

Acting Commissioner of Patents and Trademarks



US005107867A

**United States Patent** [19][11] **Patent Number:** **5,107,867****Barrington**[45] **Date of Patent:** **Apr. 28, 1992****[54] PROCESS FOR EXTENDING HUMAN HAIR**[76] **Inventor:** **Mark C. Barrington, 8432 Aplite Ct.,  
Citrus Heights, Calif. 95610**[21] **Appl. No.:** **753,211**[22] **Filed:** **Aug. 29, 1991**[51] **Int. Cl.:** **A41G 3/00**[52] **U.S. Cl.:** **132/201; 132/53**[58] **Field of Search:** **132/200, 201, 53, 54,  
132/56****[56] References Cited****U.S. PATENT DOCUMENTS**

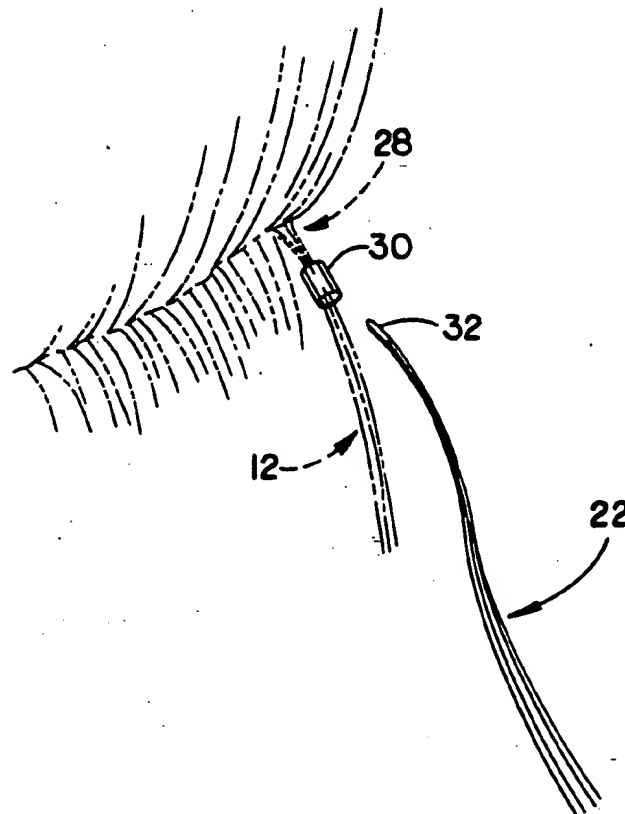
2,621,663	12/1952	Jenkins	132/201
2,865,380	12/1958	Mitchell	132/201
3,295,534	1/1967	Dorkin	132/201
3,530,862	9/1970	Hudson	132/201
3,835,868	9/1974	Heck	132/201
3,970,092	7/1976	Nelson	132/201
4,372,330	2/1983	Nelson	132/53
4,934,387	6/1990	Megna	132/201
4,982,748	1/1991	Trimarchi	132/201

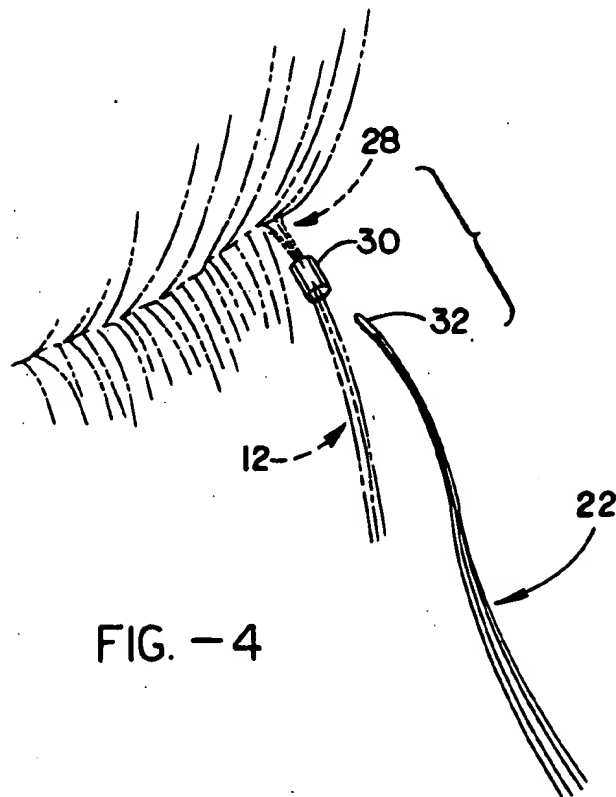
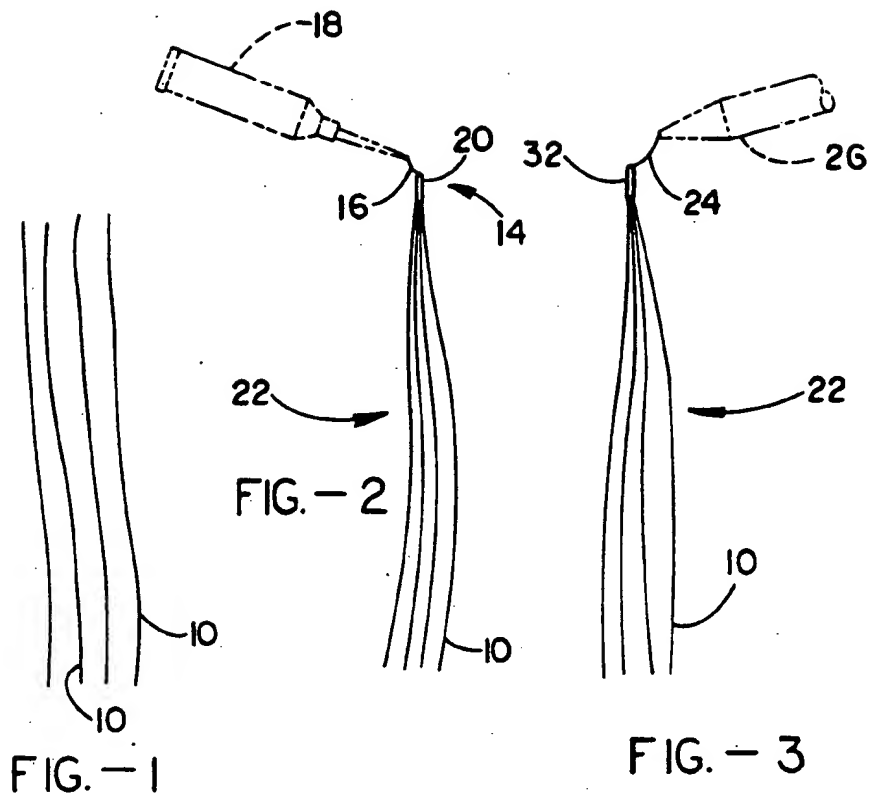
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*Primary Examiner*—John J. Wilson*Assistant Examiner*—Frank A. LaViola*Attorney, Agent, or Firm*—John P. O'Banion**[57] ABSTRACT**

A reversible process for attaching permanent extensions to human hair in which strands of supplemental hair are joined with a thermostable adhesive to form a plug of supplemental hair, a coating of thermosetting adhesive is applied over the thermostable adhesive and cured, strands of the person's natural hair are threaded through a section of heat shrinkable tubing, the plug of supplemental hair is inserted into the heat shrinkable tubing, and heat is applied to the heat shrinkable tubing so that the thermosetting adhesive liquifies and joins the plug of supplemental hair and natural hair, and the heat shrinkable tubing shrinks in size to compress and seal the junction. The permanent extension can be removed by reapplication of heat to the heat shrinkable tubing.

**18 Claims, 2 Drawing Sheets**



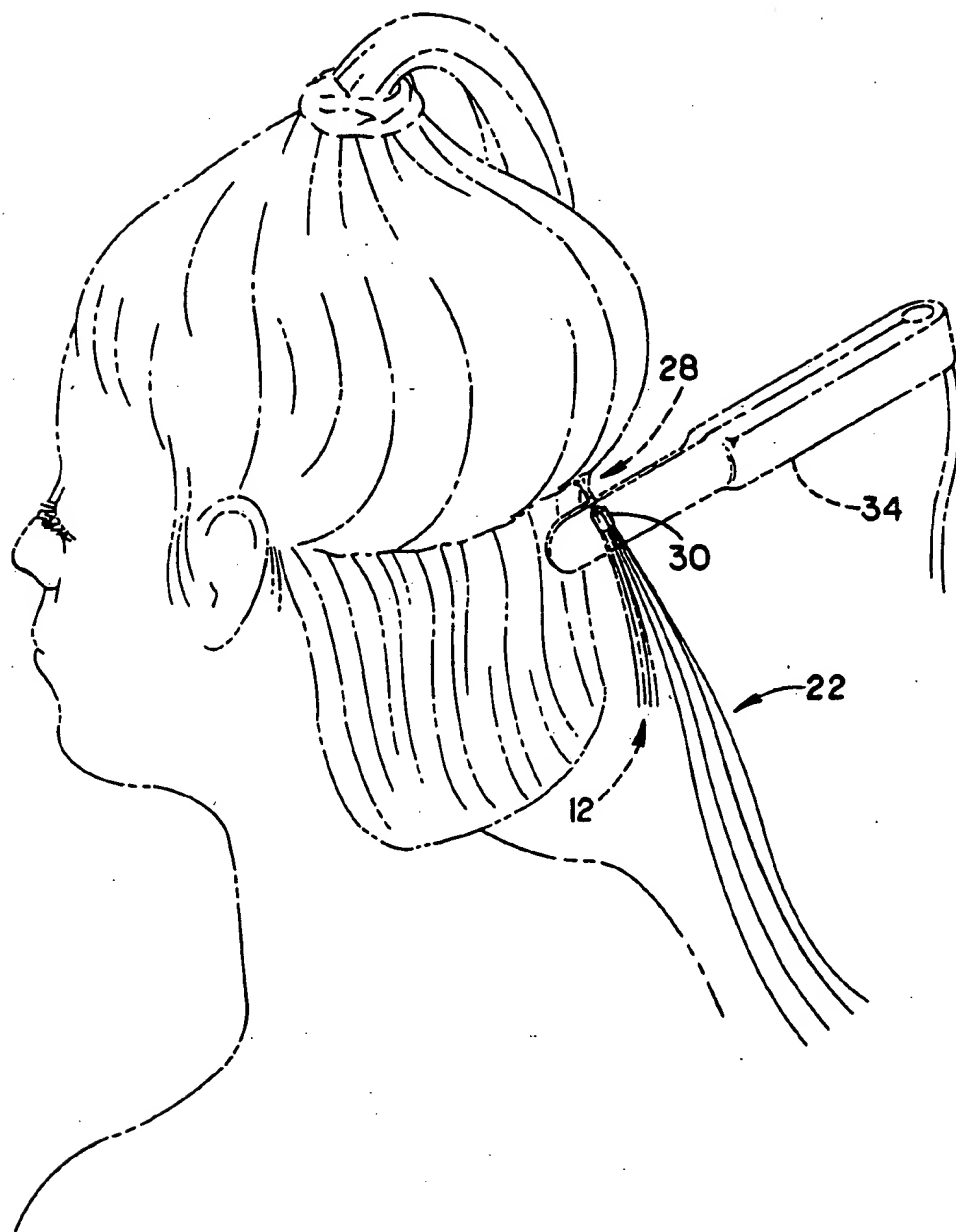


FIG. - 5

## PROCESS FOR EXTENDING HUMAN HAIR

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates generally to hair extension techniques, and more particularly to a process for extending human hair which uses adhesives and heat shrinkable tubing to produce a hair extension which is durable, permanent, and generally impervious to the elements.

#### 2. Description of the Background Art

While many persons suffer from loss or thinning of their hair and, therefore, seek more traditional solutions such as implants and hairpieces, others simply desire to change their appearance through longer or shorter hair styles. For many, changing a hair style is as commonplace as changing attire from day to day. Quite often, a hair style will require a shorter or longer cut than the person currently possesses.

It is well known that an easy solution to achieve a shorter hair style is to cut the hair. Once cut, however, it is far more difficult to lengthen the hair. Therefore, hair extensions have become a popular way for persons with short hair to change to a longer hair style. Many persons often seek an extension which lasts only for a few days. Others might desire a more permanent extension which lasts for several weeks or months.

Several approaches to hair extensions have been previously developed. For example, U.S. Pat. No. 4,982,748 issued to Trimarchi on Jan. 8, 1991, discloses a method of semi-permanent attachment of filaments of synthetic hair to sections of natural hair through the ordered sectioning of the natural hair and the intertwining or braiding of the natural and synthetic hair followed by wrapping the braided portion of natural and synthetic hair with a portion of synthetic hair, applying a sealer, and then applying heat to the wrapped layer of synthetic hair. The heat causes the sealer to change from a liquid to a semi-solid, and is applied only to the wrapped layer of synthetic hair and not to the natural hair thereby preventing damage to the natural hair. U.S. Pat. No. 4,934,387 issued to Megna on June 19, 1990, discloses a method for lengthening hair wherein strands of supplemental hair are aligned with strands of the natural hair, a colored thermoplastic adhesive is applied to the junction of the supplemental hair and natural hair with a glue gun, the glue is permitted to partially cool at which time the glued junction is rolled between the fingers to intertwine the strands of hair, and the combined hair is then styled. U.S. Pat. No. 4,372,330 issued to Nelson on Feb. 8, 1983, discloses a method for attaching hair wherein a pair of filaments are intertwined with tufts of the user's natural hair into a braid. Glue is used to seal the weave in place. U.S. Pat. No. 3,835,868 issued to Heck on Sept. 17, 1974, discloses a method for making hairpieces on a form which includes pulling the strands of hair away from the form, applying a resin to the base of the strands, and curing the resin so that the strands emerge from the form at an abrupt angle as opposed to laying flat. U.S. Pat. No. 2,621,663 issued to Jenkins on Dec. 16, 1952, discloses a weaving method for permanently attaching supplemental hair to natural hair. U.S. Pat. No. 2,865,380 issued to Mitchell on Dec. 23, 1958, discloses a weave method for attaching a hairpiece of multiple tufts connected to a flexible rod to natural hair, the natural hair being plaited to facilitate attachment. U.S. Pat. No. 3,530,862 issued to Hudson

on Sept. 29, 1970, discloses aligning multiple strands of hair to rods and then using an elastic band to hold the rods and multiple strands of hair together to form a hairpiece. U.S. Pat. No. 3,295,534 issued to Dorkin on Jan. 3, 1967, discloses a method of thickening hair by permanently attaching additional strands of hair to natural hair with an adhesive.

In order for a hair extension which uses adhesives to be "permanent" so that it will last several weeks or months and not shed or mat, the adhesive junction of the supplemental hair and the person's natural hair must be resistant to foreign elements such as chlorine, permanent wave solutions, coloring solutions, bacteria, oils, shampoos, hair sprays, heat, and the like. Such a solution does not exist in the hair extension techniques previously developed. Therefore, there is a need for an easily implemented, improved process for attaching strands of supplemental hair to a person's natural hair in which the junction between the supplemental hair and the natural hair is generally impervious to these types of foreign elements.

The foregoing patents reflect the state of the art of which the applicant is aware and are tendered with the view toward discharging applicant's acknowledged duty of candor in disclosing information which may be pertinent in the examination of this application. It is respectfully stipulated, however, that none of these patents teach or render obvious, singly or when considered in combination, applicant's claimed invention.

### SUMMARY OF THE INVENTION

The process of the present invention fabricates hair extension "plugs" from bundles of strands of natural or synthetic supplemental hair. The strands are joined together at one end of the bundle with a thermostable adhesive such as cyanoacrylate to form a plug of supplemental hair, one end of which will have a hardened tip while the other end will have free-flowing strands of supplemental hair. Once the thermostable adhesive cures to a hardened state, the tip of the plug is coated with a thermosetting adhesive such as a hot melt glue. After the thermosetting adhesive cools to a hardened state, the plug of supplemental hair is ready to attach to the person's natural hair. Strands of the person's natural hair are then threaded through a section of heat shrinkable tubing, and the thermosetting adhesive coated tip of the plug of supplemental hair is inserted into the heat shrinkable tubing. Heat is then applied to the heat shrinkable tubing with, for example, a hair flat iron until the thermosetting adhesive liquifies and joins the tip of the plug of supplemental hair with the person's natural hair, and the heat shrinkable tubing shrinks in size to compress and seal the junction. The permanent extension can be removed by reapplication of heat with the hair flat iron.

An object of the invention is to provide a method for easily applying hair extensions.

Another object of the invention is to provide a method for attaching permanent hair extensions.

Another object of the invention is to provide a method of extending the length of human hair in which the junction between the natural hair and supplemental hair is highly resistant to bacteria, chlorine, permanent wave solutions, hair coloring solutions, and the like.

Another object of the invention is to provide a method for permanent hair extension which can be easily reversed when desired.



Another object of the invention is to provide for hair extensions in which the strands of hair do not shed.

Still another object of the invention is to provide for hair extensions in which the strands of hair do not mat together.

Further objects and advantages of the invention will be brought out in the following portions of the specification, wherein the detailed description is for the purpose of fully disclosing preferred embodiments of the invention without placing limitations thereon.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more fully understood by reference to the following drawings which are for illustrative purposes only:

FIG. 1 is a view of a bundle of strands of supplemental hair prior to formation into a hair extension plug.

FIG. 2 shows the application of a thermostable adhesive to the strands of supplemental hair at one end of the bundle shown in FIG. 1 to form a plug of supplemental hair.

FIG. 3 shows the application of a thermosetting adhesive to the tip of the plug of supplemental hair shown in FIG. 2.

FIG. 4 is a partial perspective view of the back of the head of a person showing the insertion of strands of natural hair through a length of heat shrinkable tubing just prior to insertion of the plug of supplemental hair shown in FIG. 3.

FIG. 5 is a perspective view of the back of the head of the person shown in FIG. 4 which shows the application of heat to the heat shrinkable tubing after insertion of the plug of supplemental hair shown in FIG. 3.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more specifically to the drawings, for illustrative purposes the process of the present invention is embodied in the steps generally shown in FIGS. 1 through 5. It will be appreciated that the process may vary as to configuration and as to details of the steps and materials employed without departing from the basic concepts as disclosed herein.

Referring to FIG. 1, a plurality of strands of supplemental hair 10 are bundled together as shown. Typically, this calls for approximately twenty-five to fifty strands of supplemental hair 10 to be aligned in a generally parallel configuration. Although strands of supplemental hair 10 could be made of synthetic materials, strands of human hair are preferred for a more natural appearance. Preparation and cleansing of strands of supplemental hair 10, as well as the person's natural hair 12 (FIG. 4), is an important step in that it promotes proper adhesion of the thermostable and thermosetting adhesives used in this process. Preferably a celating shampoo such as Remove-All made by Tressa is used to cleanse the supplemental and natural hair and remove dirt, chlorine, hair spray, oils, residues, gels, wax, and the like so as to provide a good bonding surface. Any hair which is cleansed should be thoroughly dried before proceeding.

Referring to FIG. 2, after strands of supplemental hair 10 are cleansed and dried, they are gathered together at end 14 and a thermostable adhesive 16 is applied from applicator 18, thereby coating and impregnating strands of supplemental hair 10 at end 14. Thermostable adhesive 16 is preferably a heat resistant, air drying adhesive such as cyanoacrylate. Thermostable

adhesive 16 cures and hardens into tip 20, thereby forming supplemental hair plug 22.

Referring to FIG. 3, after thermostable adhesive 16 hardens, it is coated with thermosetting adhesive 24 which is applied from applicator 26. Thermosetting adhesive 24 can be any thermosetting natural or synthetic polymer adhesive, such as Thermogrip® brand hobby type hot melt glue which is water repellent. The thermosetting adhesive 24 is then allowed to cool and harden.

Referring to FIG. 4, the next step is to divide or otherwise orderly section the person's natural hair into one or more application zones 28. Each application zone 28 should preferably be spaced approximately one-quarter inch (6.4 millimeters) apart both horizontally and vertically for proper blending of the supplemental hair with the natural hair. Prior to application of plug 22, the natural hair is parted across the back of the head and combed over the top of the head to the extent possible as shown in FIG. 5. As a result, each supplemental hair plug 22 will cover the area bounded by a square which is one-quarter inch (6.4 millimeters) on each side.

Approximately twenty-five to fifty strands of natural hair 12 are then threaded through a length of heat shrinkable tubing 30 which is approximately one-quarter inch (6.4 millimeters) long, and heat shrinkable tubing 30 is positioned approximately three-eighths of an inch (9.5 millimeters) away from the scalp. Heat shrinkable tubing 30 preferably has a diameter of approximately three-thirty seconds of an inch (2.4 millimeters) and reduces in size by approximately fifty percent upon application of heat. Any standard grade heat shrinkable tubing such as that made by Icorally for electronic purposes is suitable. Thermosetting adhesive coated tip 32 of supplemental hair plug 22 is then inserted approximately half way into heat shrinkable tubing 30.

Referring now to FIG. 5, a hair flat iron 34 or other heat source is used to apply heat to heat shrinkable tubing 30 for approximately five seconds or until thermosetting adhesive 24 liquifies. When thermosetting adhesive 24 liquifies, it flows over the strands of natural hair 12 to bind natural hair 12 to tip 20 of supplemental hair plug 22. Heat shrink tubing 30 shrinks to compress the junction of natural hair 12 and tip 20 of supplemental hair plug 22. Note that thermostable adhesive 16 which surrounds strands of supplemental hair 10 to form tip 20 does not liquify at this point and, therefore, heat shrink tubing 30 does not flatten but retains a cylindrical shape when it shrinks. Thermosetting adhesive 24, however, liquifies and flows inside heat shrinkable tubing 30 to saturate and seal the junction of supplemental hair plug 22 and natural hair 12. Thermosetting adhesive 24 is then allowed to cool and harden, and the person's natural hair (or other supplemental hair) is combed down to hide the heat shrinkable tubing 30. In this manner, a natural looking hair extension results.

Removal of supplemental hair plug 22 can be effected by re-heating heat shrinkable tubing 30, pulling out supplemental hair plug 22, and sliding heat shrinkable tubing 30 off of natural hair 12. Traces of thermosetting adhesive 24 which remain in natural hair 12 can be removed by conventional non-damaging techniques if necessary.

Accordingly, it will be seen that this invention presents a reversible process for permanently joining natural hair to supplemental hair in a way that the adhesive junction of the supplemental and natural hair is gener-

ally impervious to bacteria, heat, hair conditioners, permanent wave solutions, hair coloring solutions, dirt, and the like. Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. Thus the scope of this invention should be determined by the appended claims and their legal equivalents.

I claim:

1. A process for attaching supplemental hair to human natural hair, comprising the steps of:

- (a) coating one end of a plug of supplemental hair with thermosetting adhesive;
- (b) allowing said thermosetting adhesive to harden;
- (c) threading a plurality of strands of natural hair through a length of heat shrinkable tubing;
- (d) inserting the thermosetting adhesive coated end of said plug of supplemental hair into said heat shrinkable tubing;
- (e) applying heat to said heat shrinkable tubing and said thermosetting adhesive; and
- (f) allowing said thermosetting adhesive to harden.

2. The process recited in claim 1, further comprising the step of cleansing said natural hair with a celating shampoo prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

3. The process recited in claim 1, further comprising the step of drying said cleansed natural hair.

4. The process recited in claim 1, further comprising the step of dividing said natural hair into a plurality of application zones prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

5. The process recited in claim 1, wherein each said plug of supplemental hair contains from 25 to 50 strands.

6. The process recited in claim 1, further comprising the step of covering the junction of said plug of supplemental hair and said natural hair with natural or supplemental hair.

7. A process for extending the length of a person's natural hair with supplemental hair, comprising the steps of:

- (a) bundling a plurality of strands of supplemental hair, said bundle of strands of supplemental hair having a first end and a second end;
- (b) impregnating said first end of bundle of strands of supplemental hair with thermostable adhesive;
- (c) forming a plug of supplemental hair by allowing said thermostable adhesive to harden and bind said first end of said bundle of strands of supplemental hair;
- (d) coating said hardened thermostable adhesive with thermosetting adhesive;
- (e) allowing said thermosetting adhesive to harden;

- (f) threading a plurality of strands of natural hair through a length of heat shrinkable tubing;
- (g) inserting the thermosetting adhesive coated end of said plug into said heat shrinkable tubing;
- (h) applying heat to said heat shrinkable tubing and said thermosetting adhesive; and
- (i) allowing said thermosetting adhesive to harden.

8. The process recited in claim 7, further comprising the step of cleansing said natural hair with a celating shampoo prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

9. The process recited in claim 7, further comprising the step of drying said cleansed natural hair.

10. The process recited in claim 7, further comprising the step of dividing said natural hair into a plurality of application zones prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

11. The process recited in claim 7, wherein each said plug of supplemental hair contains from 25 to 50 strands.

12. The process recited in claim 7, further comprising the step of covering the junction of said plug and said natural hair with natural or supplemental hair.

13. A hair extension process, comprising the steps of:

- (a) coating one end of each of a plurality of strands of supplemental hair with thermostable adhesive;
- (b) joining said coated ends of said plurality of strands of supplemental hair to form a plug of supplemental hair;
- (c) allowing said thermostable adhesive to harden;
- (d) coating said hardened thermostable adhesive with thermosetting adhesive;
- (e) allowing said thermosetting adhesive to harden;
- (f) threading a plurality of strands of natural hair through a length of heat shrinkable tubing;
- (g) inserting the thermosetting adhesive coated end of said plug into said heat shrinkable tubing;
- (h) applying heat to said heat shrinkable tubing and said thermosetting adhesive; and
- (i) allowing said thermosetting adhesive to harden.

14. The process recited in claim 13, further comprising the step of cleansing said natural hair with a celating shampoo prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

15. The process recited in claim 13, further comprising the step of drying said cleansed natural hair.

16. The process recited in claim 13, further comprising the step of dividing said natural hair into a plurality of application zones prior to the step of threading said plurality of strands of natural hair through said heat shrink tubing.

17. The process recited in claim 13, wherein each said plug of supplemental hair contains from 25 to 50 strands.

18. The process recited in claim 13, further comprising the step of covering the junction of said plug and said natural hair with natural or supplemental hair.

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